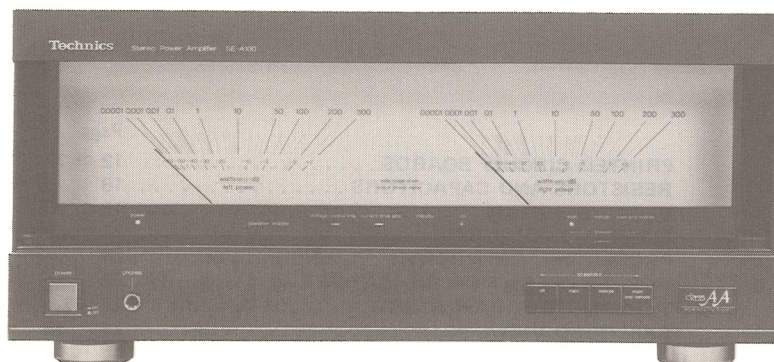


Service Manual

Stereo Power Amplifier

Amplifier
SE-A100



Color

(K) . . . Black Type

Color	Areas
(K)	[D] . . . Continental Europe
(K)	[EW] . . . Switzerland
(K)	[EK] . . . United Kingdom
(K)	[XL] . . . Australia
(K)	[EGA] . . . F.R. Germany
(K)	[EB] . . . Belgium
(K)	[EH] . . . Holland
(K)	[EF] . . . France
(K)	[Ei] . . . Italy
(K)	[XA] . . . Asia, Oceania, Africa, Middle Near East and Latin America
(K)	[PA] . . . Far East PX
(K)	[PE] . . . European Military

SPECIFICATIONS (DIN 45 500)

■ AMPLIFIER SECTION

20 Hz~20 kHz continuous power output both channels driven	2 × 240W (4Ω) 2 × 170W (8Ω)
40 Hz~16 kHz continuous power output both channels driven	2 × 240W (4Ω) 2 × 170W (8Ω)
1 kHz continuous power output both channels driven	2 × 260W (4Ω) 2 × 180W (8Ω)
Total harmonic distortion	
rated power at 20 Hz~20 kHz	0.002% (4Ω) 0.0007% (8Ω)
rated power at 40 Hz~16 kHz	0.002% (4Ω) 0.0007% (8Ω)
rated power at 1 kHz	0.0004% (4Ω) unmeasurably small, less than 0.0002% (8Ω)
half power at 20 Hz~20 kHz	0.0007% (8Ω)
half power at 1 kHz	unmeasurably small, less than 0.0002% (8Ω)
-26 dB power at 1 kHz	0.001% (4Ω)
50 mW power at 1 kHz	0.003% (4Ω)
Intermodulation distortion	
rated power at 250 Hz: 8 kHz=4:1, 4Ω	0.002%
rated power at 60 Hz: 7 kHz=4:1, SMPTE, 8Ω	0.002%
TIM (Transient Intermodulation Distortion)	unmeasurably small

Power bandwidth	
both channels driven, -3 dB (T.H.D. 0.01%)	5 Hz~100 kHz (8Ω)
Residual hum and noise	0.3 mV
Damping factor	50 (4Ω), 100 (8Ω)
Input sensitivity and impedance	1.0 V/47kΩ
S/N	110 dB (120 dB, IHF, A)
Frequency response	20 Hz~20 kHz, +0 dB, -0.1 dB 0.8 Hz~150 kHz, +0 dB, -3 dB
Channel balance, 250 Hz~6,300 Hz	0.5 dB
Channel separation, 1 kHz	60 dB
Headphones output level and impedance	870 mV/330Ω
Load impedance	
MAIN or REMOTE	4Ω~16Ω
MAIN and REMOTE	8Ω~16Ω
Meter	
reading range	0.0001 W~300 W (8Ω) -60 dB~+2 dB (logarithmic compression)
frequency response (reading accuracy)	±3 dB (more than -40 dB) ±5 dB (less than -40 dB)
attack time	100 μsec.
recovery time (0 dB - -20 dB)	300 msec.

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

Panasonic Tokyo Office
Matsushita Electric Trading Co., Ltd.
6th Floor, World Trade Center Bldg.,
No. 4-1, Hamamatsu-cho 2-Chome,
Minato-ku, Tokyo 105, Japan

■ GENERAL

Power consumption	1350W
Power supply	AC 50 Hz/60 Hz, 110V/127V/220V/240V
Dimensions (W×H×D)	430 × 209 × 475 mm
Weight	31.2 kg

Notes:

Total harmonic distortion is measured by the digital spectrum analyzer (H.P. 3045 system).

Specifications are subject to change without notice.
Weight and dimensions are approximate.

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■ SAFETY PRECAUTION

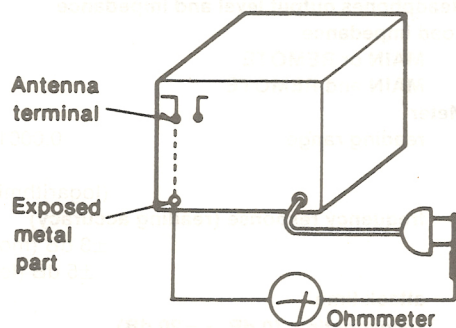
(This "safety precaution" is applied only in U.S.A.)

1. Before servicing, unplug the power cord to prevent an electric shock.
2. When replacing parts, use only manufacturer's recommended components for safety.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.
5. Before returning the serviced equipment to the customer, be sure to make the following insulation resistance test to prevent the customer from being exposed to a shock hazard.

● INSULATION RESISTANCE TEST

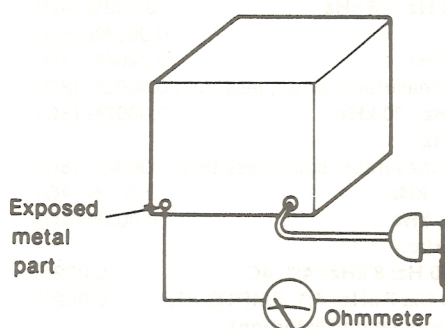
1. Unplug the power cord and short the two prongs of the plug with a jumper wire.
2. Turn on the power switch.
3. Measure the resistance value with ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as screwheads antenna, control shafts, handle brackets, etc. Equipment with antenna terminals should read between $3M\Omega$ and $5.2M\Omega$ to all exposed parts. (Fig. A) Equipment without antenna terminals should read approximately infinity to all exposed parts. (Fig. B)

Note: Some exposed parts may be isolated from the chassis by design. These will read infinity.



(Fig. A)

Resistance = $3M\Omega$ — $5.2M\Omega$



(Fig. B)

Resistance = Approx ∞

4. If the measurement is outside the specified limits, there is a possibility of a shock hazard. The equipment should be repaired and rechecked before it is returned to the customer.

FEATURE

The assigned mission of the power amplifier is to see that the speaker systems are driven exactly according to the input signals. This may seem simple, but in reality is all the more difficult for its seeming simplicity.

Moreover, this assignment has no real meaning unless it can be accomplished when sharp level fluctuations and various frequency components included in music signals are reproduced by speakers with various unstable elements.

Technics has cleared up these problems through the application of its vast technological resources and its new concepts.

The amazing answer is the **class A** SE-A100 amplifier with its pure class A sound and its overwhelming speaker drive capacity.

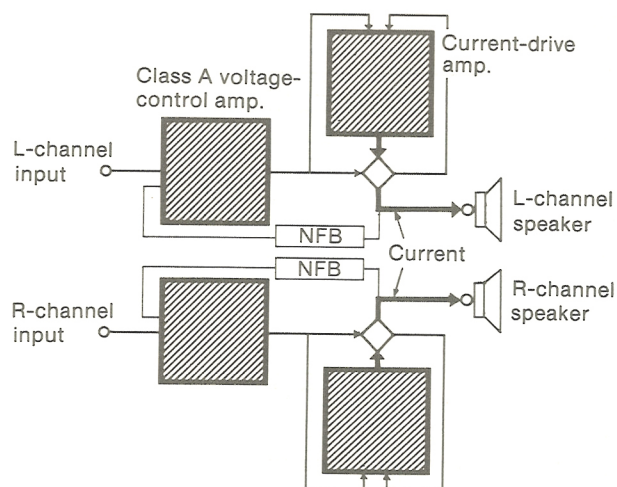
VC4 amplifier composition. **class A** equipped.

This unit has the VC4 amplifier composition ... with voltage-control amplification, class A operation in which the problems of switching distortion and crossover distortion are finally a thing of the past, plus current-drive amplification to supply the current necessary for dynamic drive of the connected speaker systems.

Thus, the voltage-control amplifier is freed of the burden of current supply, leaving it free to supply voltage faithful to incoming signals.

The characteristic of the amplification element is therefore displayed at its finest, and distortion is so low as to be virtually unmeasurable, even by highly precise instruments.

The current-drive amplifier is, on the other hand, free to supply all the current needed for speaker drive. Impedance fluctuations, phase shifts and reverse electromotive forces at every frequency point have no effect, all having been removed in order to assure a clear and stirring sound filled with high-fidelity power under any condition.



VC4 amplifier composition

170W + 170W/0.0007% ... truly high performance

The high **class A** performance is plainly expressed by the specs: high power of 170W + 170W (20 Hz ~ 20 kHz, 8Ω), and low distortion of 0.0007% (20 Hz ~ 20 kHz, 8Ω), an unrivalled rating that tells it all.

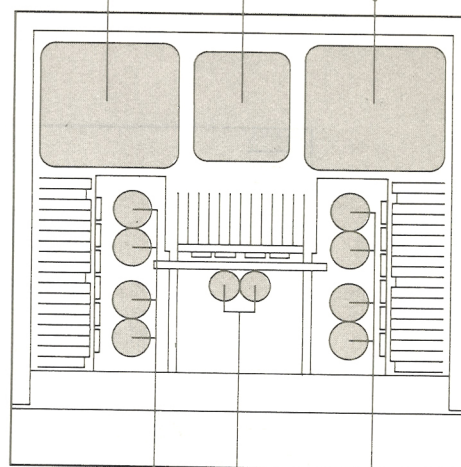
The dynamism of music can freely express itself until the whole body vibrates ... and the subtle nuances of music are expressed until covered by reverberations.

Luxuriously furnished as only the finest amplifiers would be

Beginning with the highly precise, large power meter traditional to Technics power amplifiers, and continuing with such features as the powerful power supply which uses three large transformers and high-capacity electrolytic capacitors, the LC-OFC internal wiring material, the gold clad contact relays for electronic speaker switching, and the heavy top panel for minimizing magnetic radiation and mechanical vibration ... every part of every circuit has been made to the finest possible specifications to make this the finest and most luxurious power amplifier you could want.

Three transformers

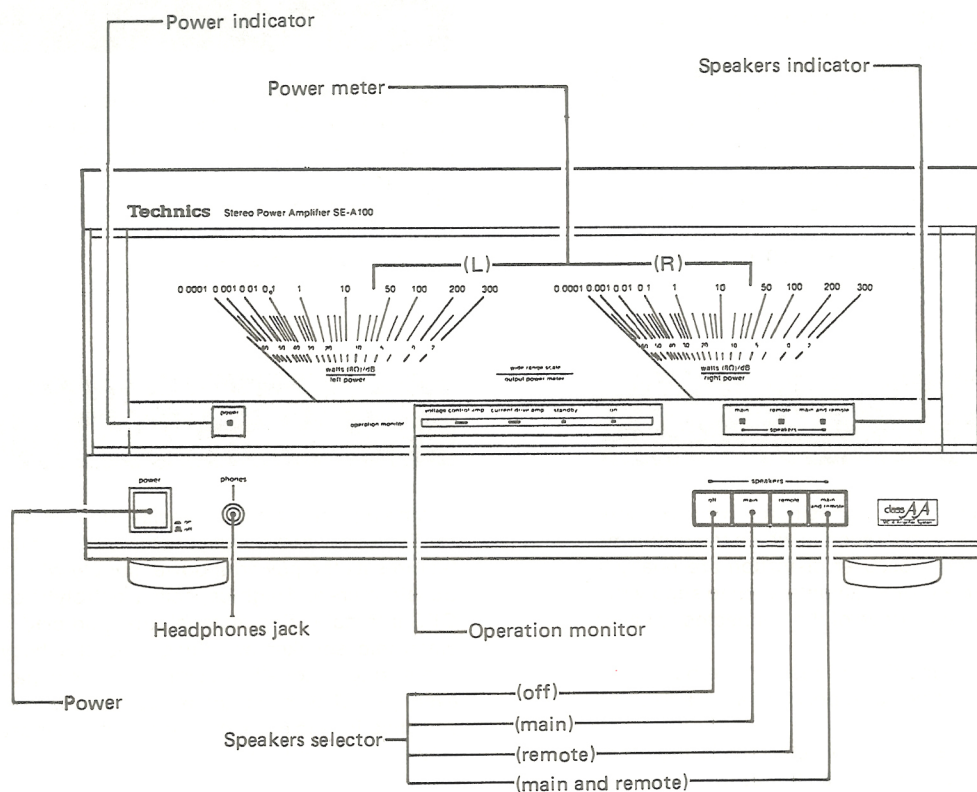
Current-drive amplifier for left channel
Voltage-control amplifier for left/right channels
Current-drive amplifier for right channel



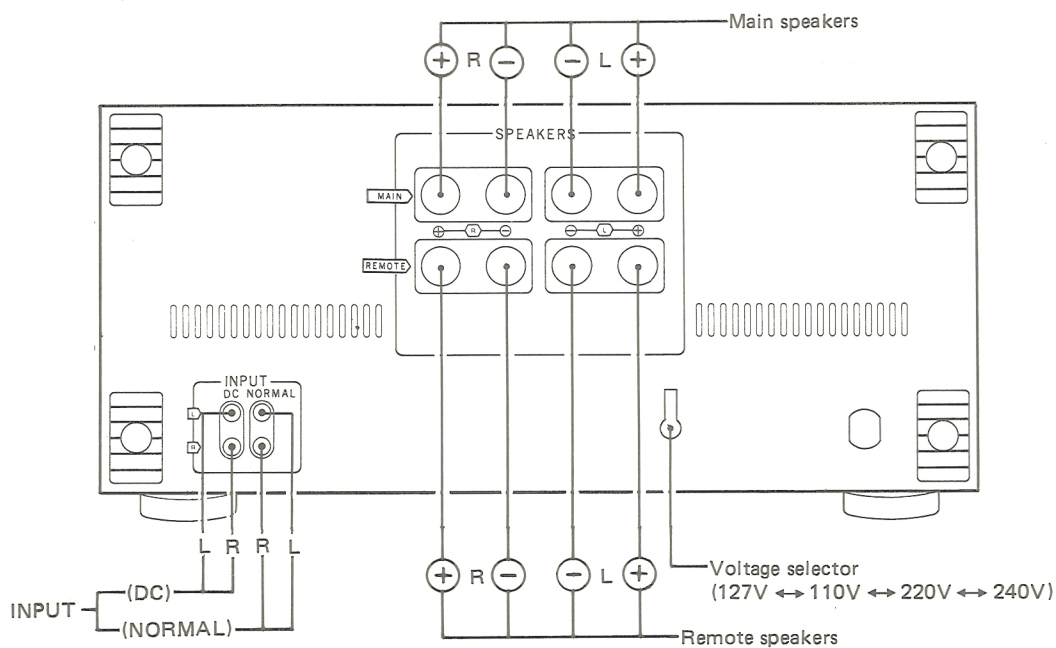
Electrolytic capacitors
(total 91,200 μF) for
power supply

SE-A100 internal construction

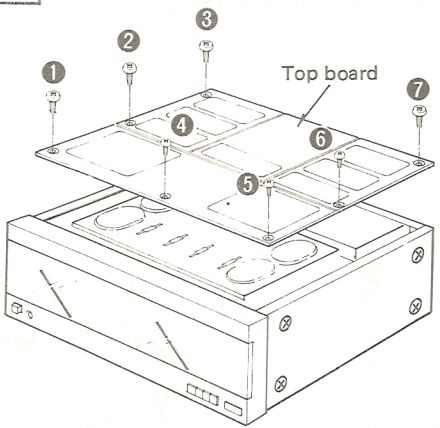
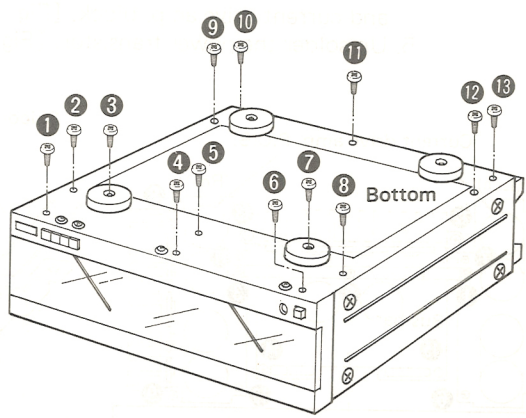
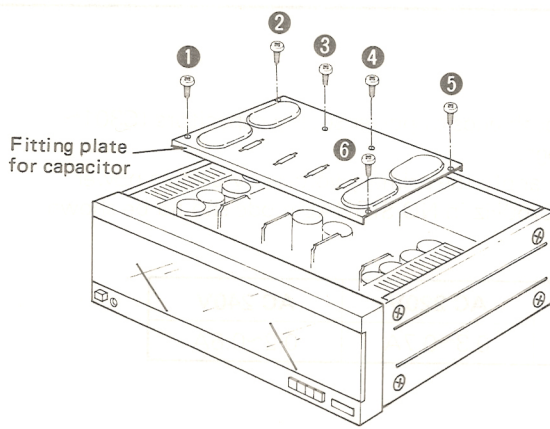
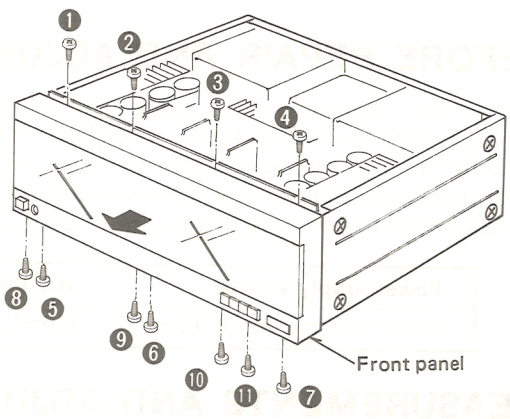
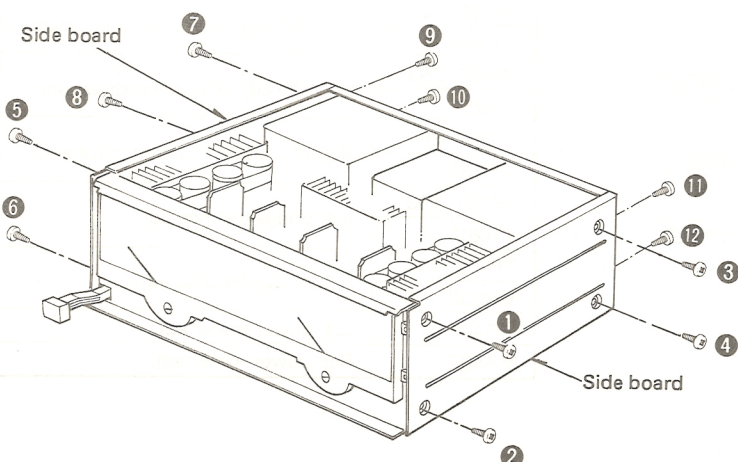
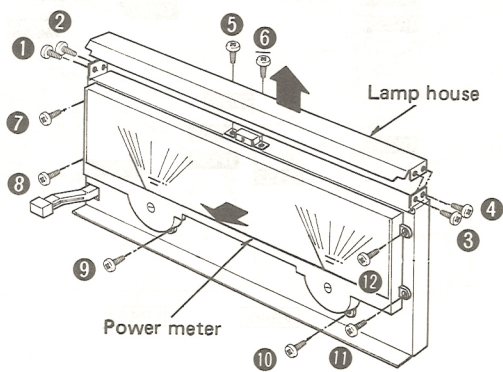
LOCATION OF CONTROLS



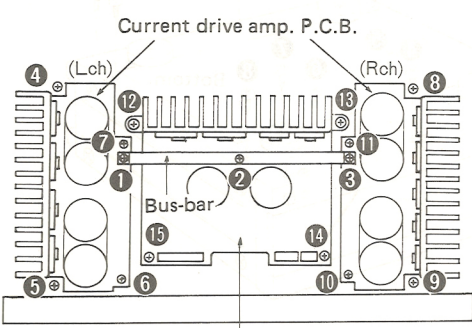
- If only the main or the remote speaker system is used ($4 \sim 16\Omega$)
- If both the main and remote speaker system are used ($8 \sim 16\Omega$)



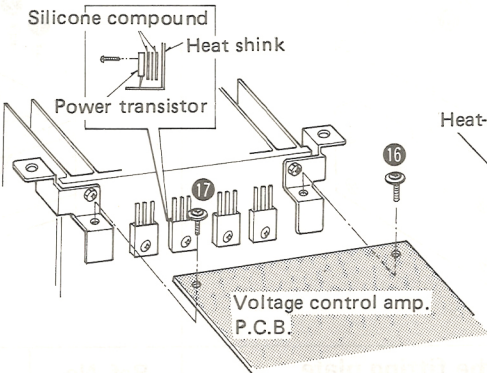
DISASSEMBLY INSTRUCTIONS

Ref. No. 1	How to remove the top board	Ref. No. 2	How to remove the bottom board
Procedure 1	• Remove the 7 setscrews (❶ ~ ❷).	Procedure 1 → 2	• Remove the 13 screws (❶ ~ ❸).
			
Ref. No. 3	How to remove the fitting plate for capacitor	Ref. No. 4	How to remove the front panel
Procedure 1 → 2 → 3	• Remove the 6 screws (❶ ~ ❸).	Procedure 1 → 4	1. Remove the 11 screws (❶ ~ ❸). 2. Remove the front panel.
			
Ref. No. 5	How to remove the side board, lamp house and power meter		
Procedure 1 → 4 → 5	1. Remove the 4 screws (❶ ~ ❸).		
			
	2. Remove the 4 screws. (❶ ~ ❸). 3. Remove the lamp house. 4. Remove the 8 screws. (❶ ~ ❸). 5. Remove the power meter.		
			

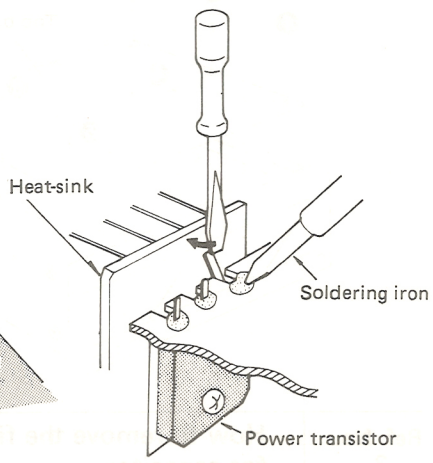
Ref. No. 6	How to remove the power transistor, voltage control amp. P.C.B. and current drive amp. P.C.B.	
Procedure 1 → 6	1. Remove the 3 screws. (① ~ ③) 2. Remove the bus-bar. 3. Remove the 12 screws. (④ ~ ⑮) 4. Remove the voltage control amp. block. and current drive amp. block. [Fig. 1] 5. Un solder the power transistor. [Fig. 3] 6. Remove the 2 screws. (⑯ ~ ⑰) 7. Remove the voltage control amp. P.C.B. 8. When mounting the power transistor apply silicone compound (SZZ0L15) to the rear side of power transistor.	



[Fig. 1]



[Fig. 2]



[Fig. 3]

Note: When you check up with the bus bar disconnected, first connect ①, ② and ③ to the ground point and turn on the machine.

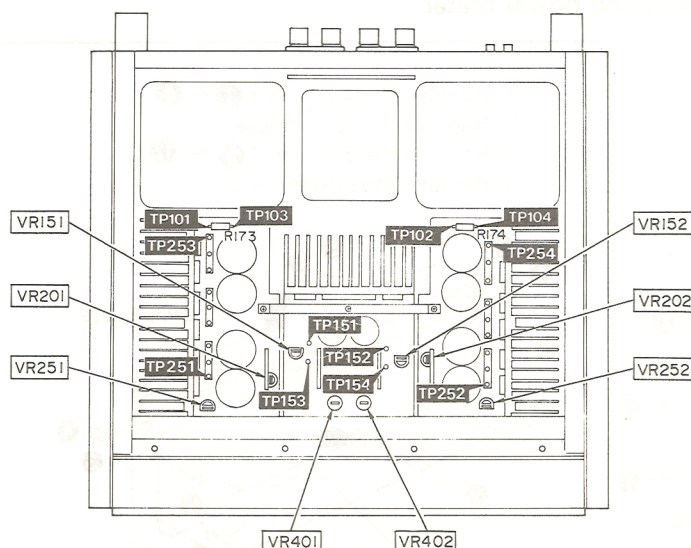
BEFORE REPAIR AND ADJUSTMENT

- (1) Turn off the power supply. Using a 10Ω, 10W resistor, shortcircuit both ends of power supply capacitors (C301~C308, 10,000μF, C309, C310, 5600μF) in order to discharge the voltage.
- (2) Before turning the power supply on, after completion of repair, slowly apply the primary voltage by using a power supply voltage controller to make sure that the consumed current at 50/60Hz in NO SIGNAL mode should be shown below with respect to supply voltage 110V/127V/220V/240V.

Power supply voltage	AC 110V	AC 127V	AC 220V	AC 240V
Consumed current 50/60Hz	0.5~1.4A	0.4~1.1A	0.3~0.7A	0.2~0.6A

MEASUREMENTS AND ADJUSTMENTS

Adjustment points



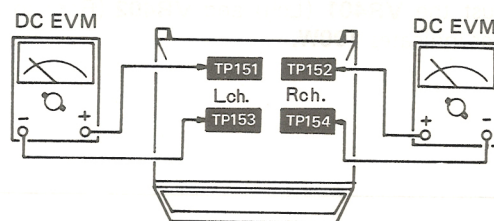
Adj. points	Adjustment
TP151, 153	Lch ICQ adj. of voltage control amp.
VR151	
TP152, 154	Rch ICQ adj. of voltage control amp.
VR152	
TP251, 253	Lch ICQ adj. of current drive amp.
VR251	
TP252, 254	Rch ICQ adj. of current drive amp.
VR252	
TP101, 103	Lch bridge-balance adj.
VR201	
TP102, 104	Rch bridge-balance adj.
VR202	
VR401	Lch power meter adj.
VR402	Rch power meter adj.

Equipment used

- AC and DC electronic voltmeter (EVM)
- Audio frequency oscillator (AF OSC)
- Dummy resistor or speaker (8Ω , 100W)

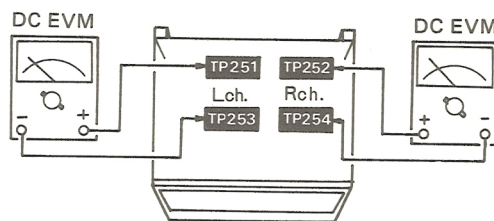
VOLTAGE CONTROL (V) AMP. IDLING (ICQ) ADJUSTMENT

1. Test equipment connection is shown in figure.
(Connect the DC EVM. on both channels.)
2. Completely turn the (V) amp. adjusting volumes (**VR151**, **VR152**) counter-clockwise.
3. Turn ON the set when it is cold, and 30 sec. later, adjust **VR151** and **VR152** so that the voltage is **3mV**. Also, check that the voltage is **10 – 18mV** (standard: **12mV**) after lapse of **10 – 15 minutes**. (Below **50mV** after lapse of **60 min.**)



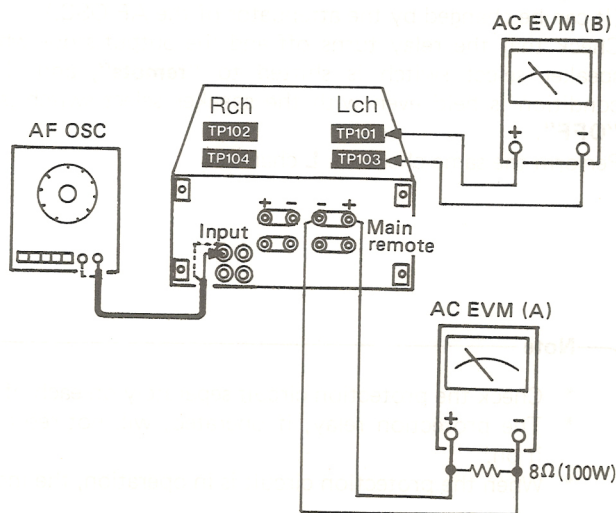
CURRENT DRIVE (C) AMP. IDLING (ICQ) ADJUSTMENT

1. Test equipment connection is shown in figure.
(Connect the DC EVM. on both channels.)
2. Completely turn the (C) amp. adjusting volumes (**VR251**, **VR252**) counterclockwise.
3. Turn ON the set when it is cold, and 30 sec. later, adjust **VR251** and **VR252** so that the voltage is **0.7mV**. Also, check that the voltage is **2 – 4mV** (standard: **2.5mV**) after lapse of **10 – 15 minutes**. (Below **20mA** after lapse of **60 min.**)



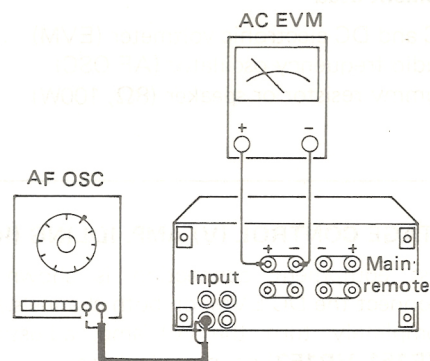
BRIDGE-BALANCE ADJUSTMENT

1. Test equipment connection is shown in figure.
2. Turn the **VR201** (Lch) and **VR202** (Rch) to the central positions before turning ON the set.
3. Apply 1kHz signal to the input terminal so that the output voltage of speaker terminal is **10V**. (It can be changed by the attenuator of the AF OSC)
4. Adjust **VR201** so that the voltage is minimum in the 3mV range of AC EVM (B).
5. Also for **R** channel, change the connection and make the same adjustment by **VR202**.



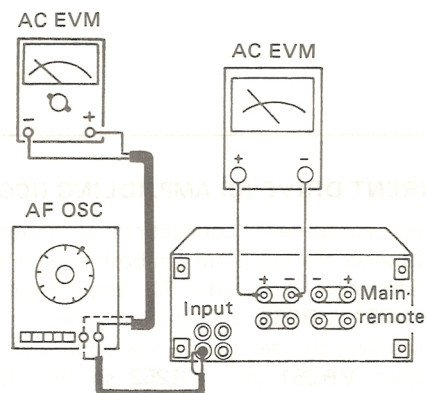
POWER METER ADJUSTMENT

1. Test equipment connection is shown in figure.
2. Turn the **VR401** (Lch) and **VR402** (Rch) to the central positions before turning **ON** the set.
3. Before adjusting make sure that the power meter is mechanically adjusted to **0** point.
4. Apply 1kHz signal to the input terminal so that the output voltage of speaker terminal is **28.3V** (It can be changed by the attenuator of the AF OSC.)
5. Adjust the **VR401** (Lch) and **VR402** (Rch) so that the power meter indicates **100W**.



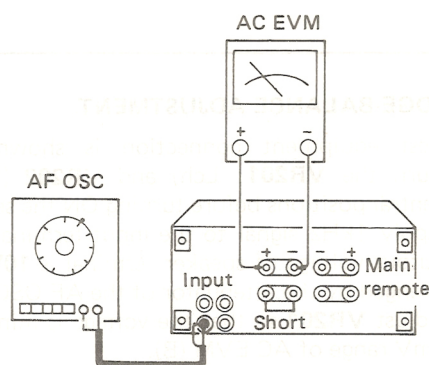
CHECK OF MUTING CIRCUIT DURING POWER "ON" – "OFF" OPERATION

1. Test equipment connection is shown in figure.
2. Apply **1kHz, 0.5V** signal to the input terminal.
3. Check that the output is given **7 – 8.5 sec.** after power **ON**, and that the output goes out immediately with power **OFF**.



CHECK OF OVERLOAD DETECTION AND PROTECTION CIRCUIT

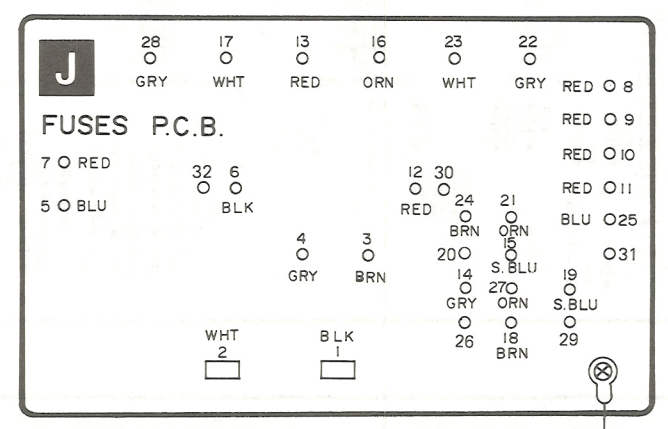
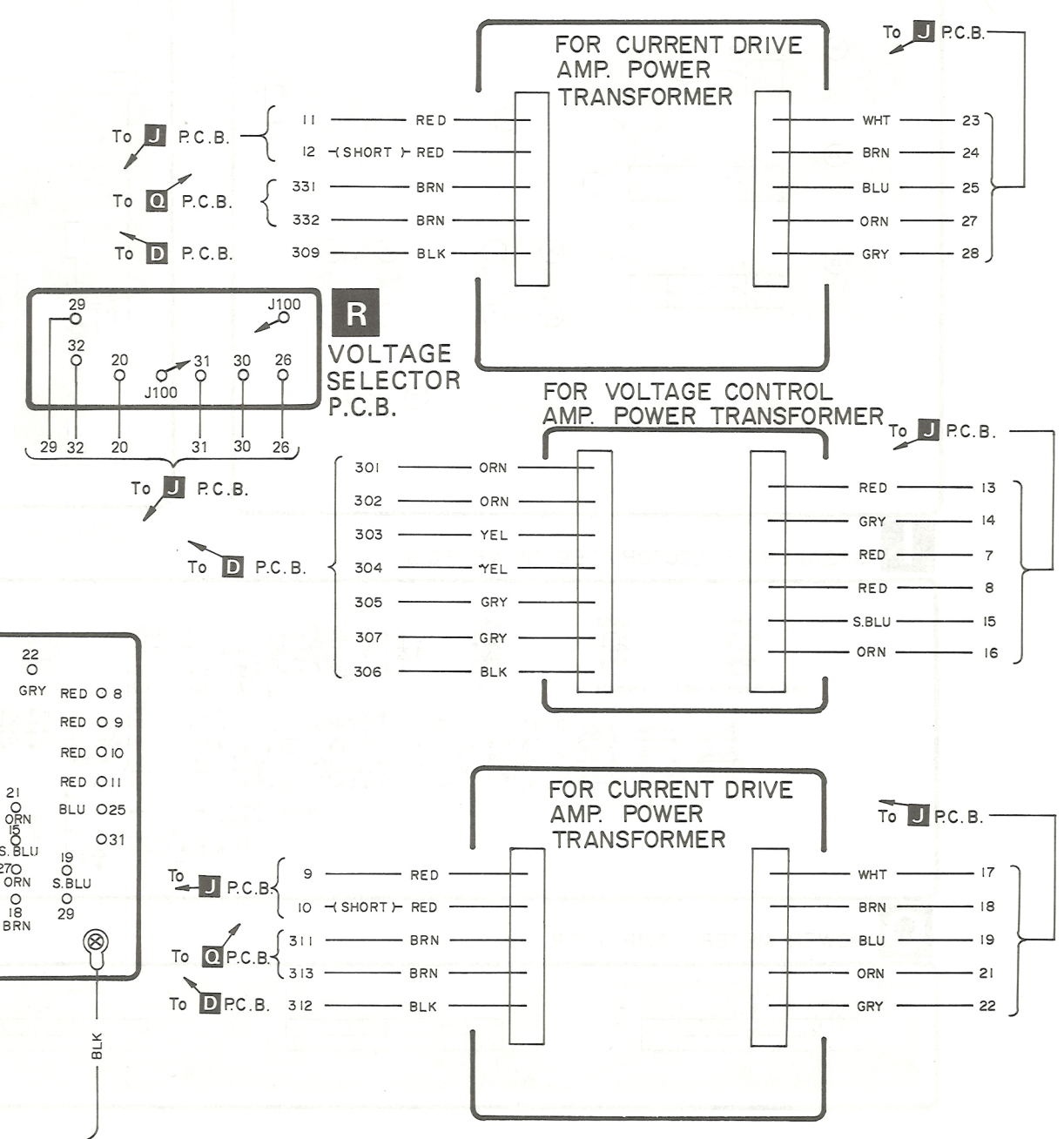
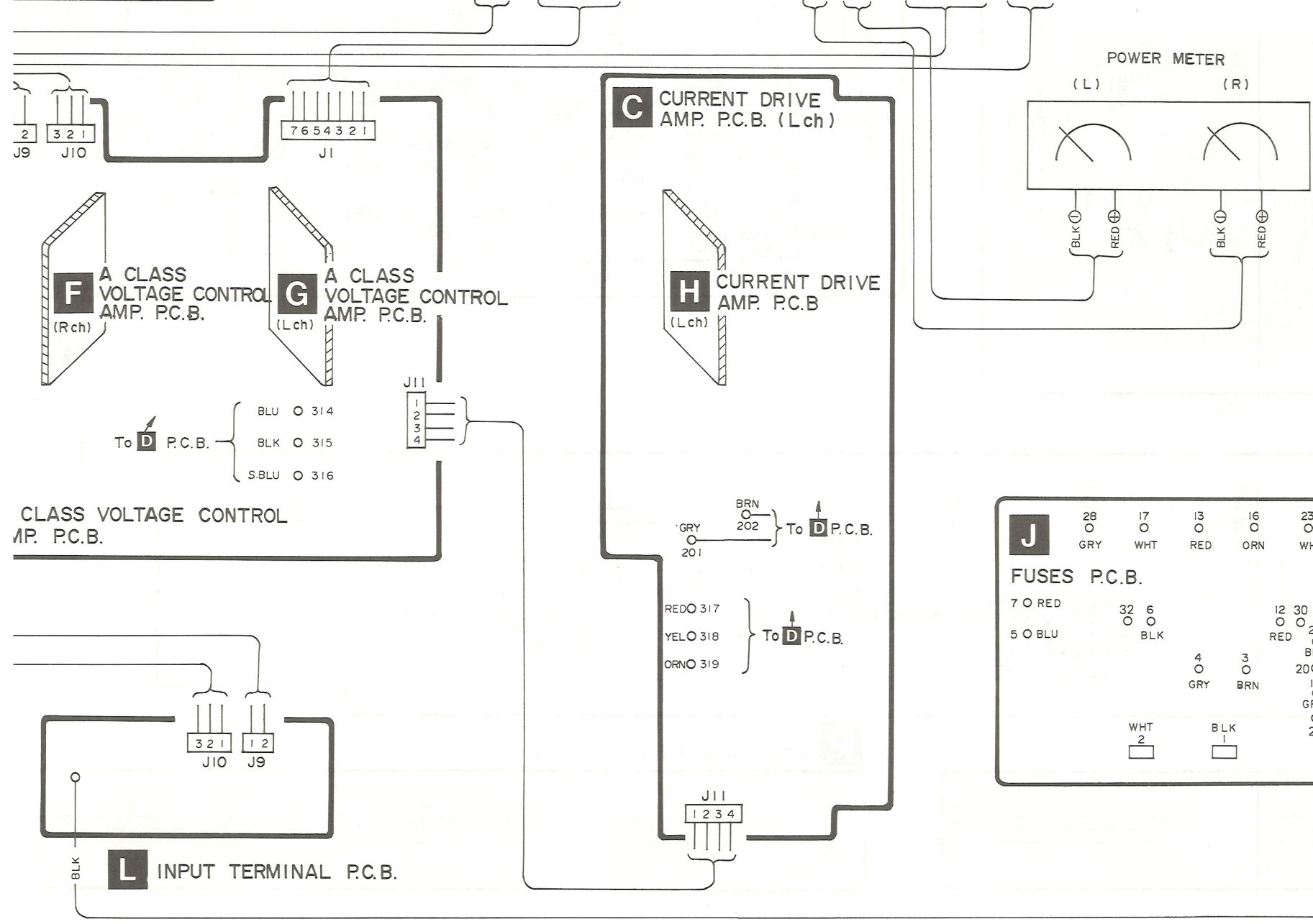
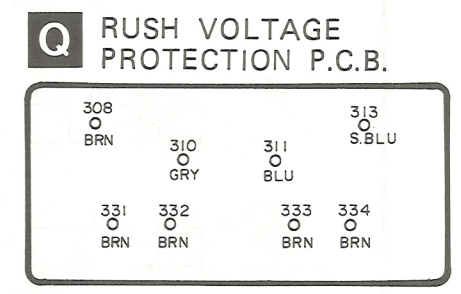
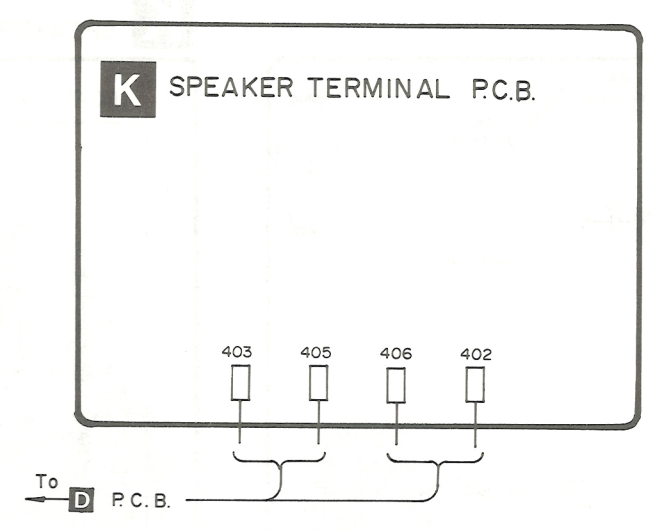
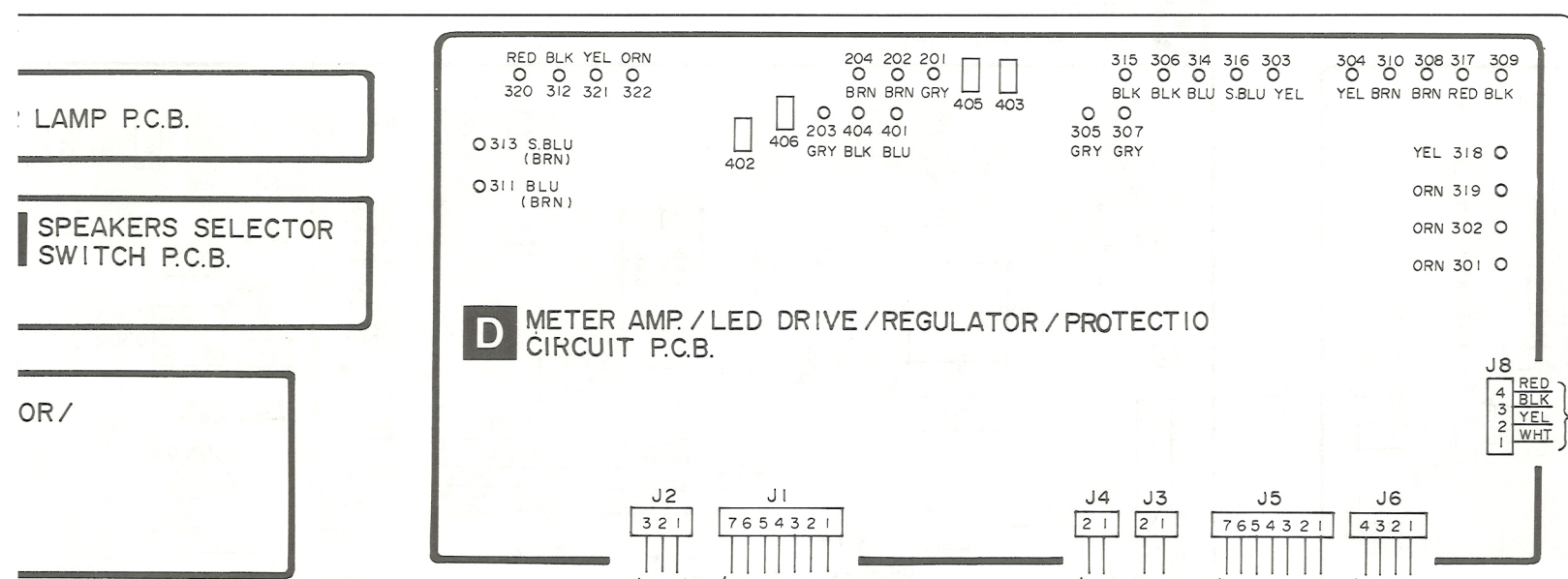
1. Test equipment connection is shown in figure.
2. Set the speaker select switch to **"main"**.
3. Short-circuit the speaker terminals on the **"remote"** side.
4. Apply 1kHz signal to the input terminal so that the output voltage of speaker terminal is **1.2V**. (It can be changed by the attenuator of the AF OSC.)
5. Check that the relay turns off and the output stops when the speaker select switch is shifted to **"remote"**, and that the condition is held even with the speaker select switch is set to **"OFF"**.
6. Perform the same check on **L** channel.



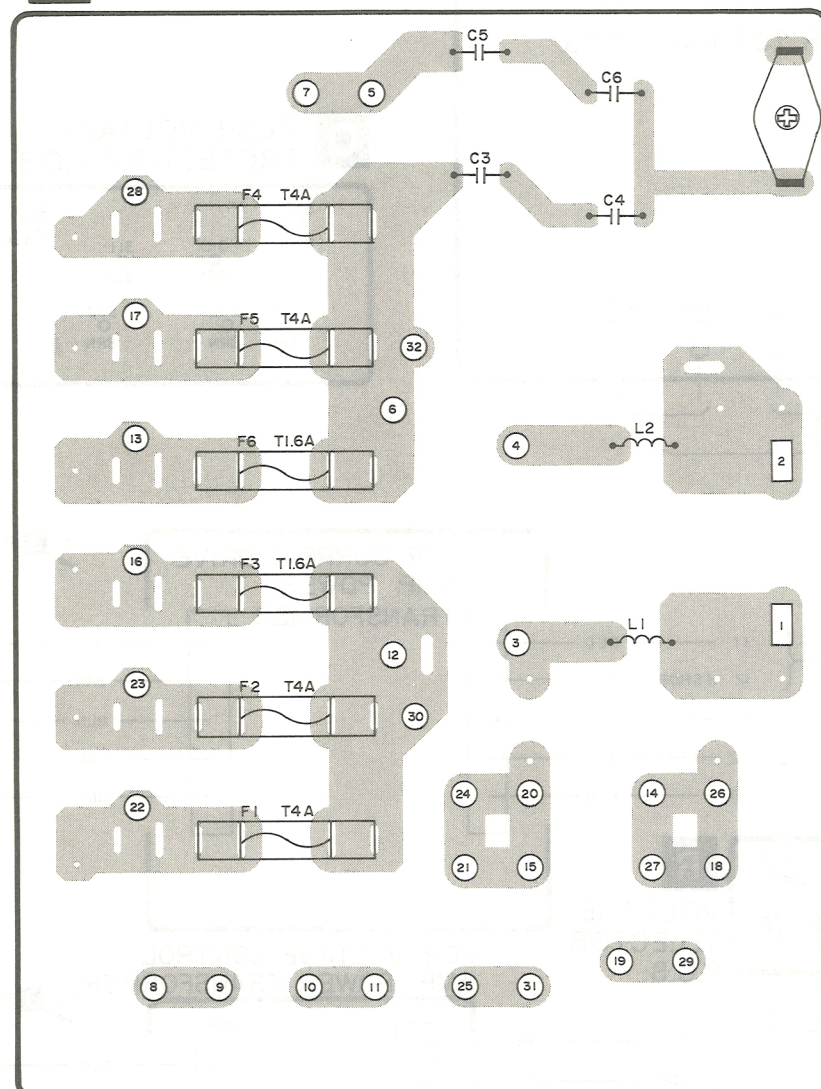
Note

- * Check the protection circuit separately on each of the channels.
- * The protection relay, if operated, will not reset itself. So, turn off the power supply and again turn it on.
- * When the protection circuit is in operation, the indicator "stand by" is blinking.

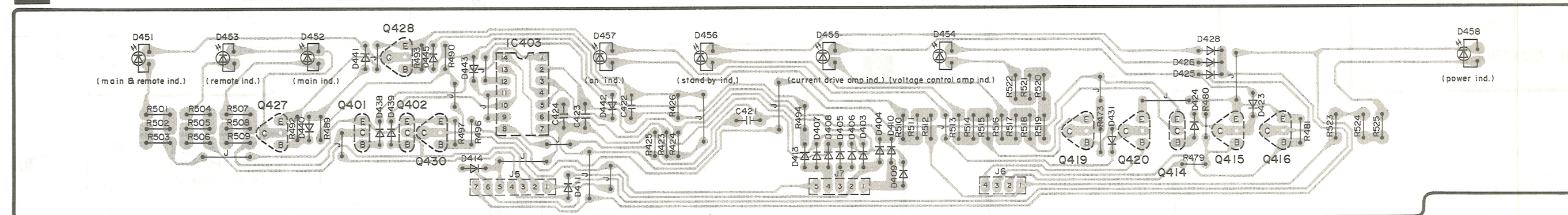




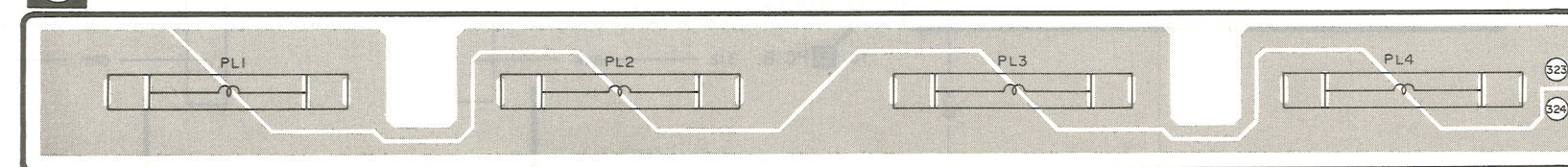
J FUSES P.C.B.



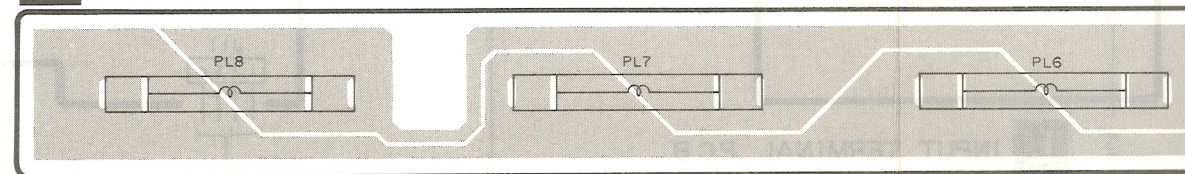
SPEAKERS SELECTOR / LED DRIVE P.C.B



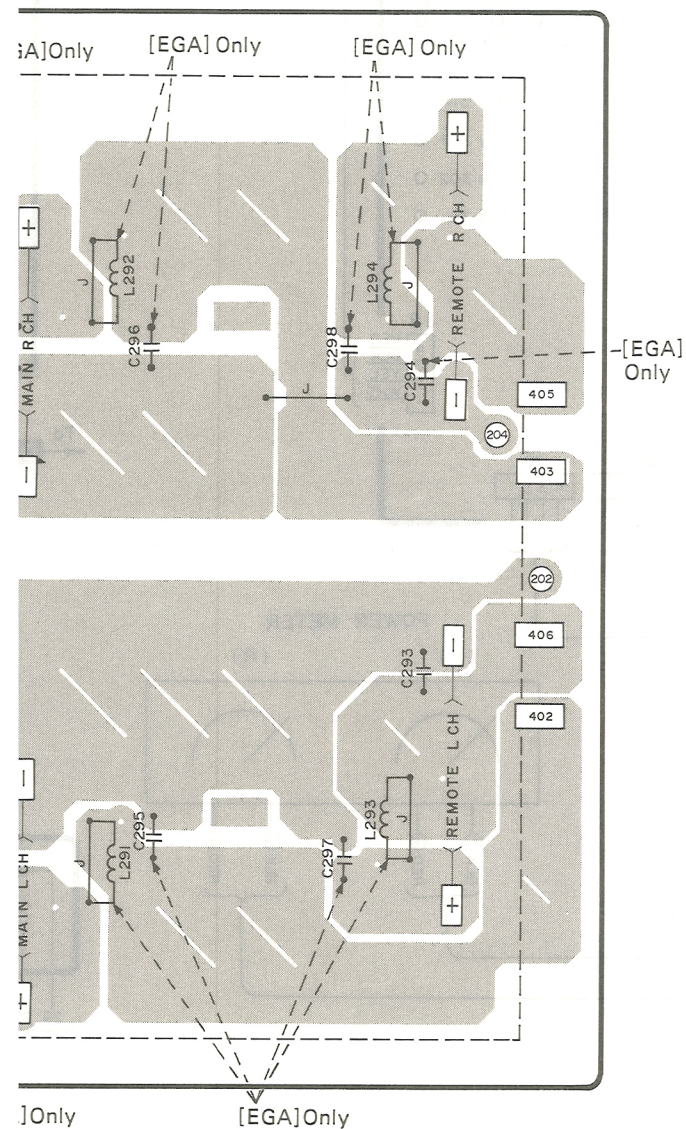
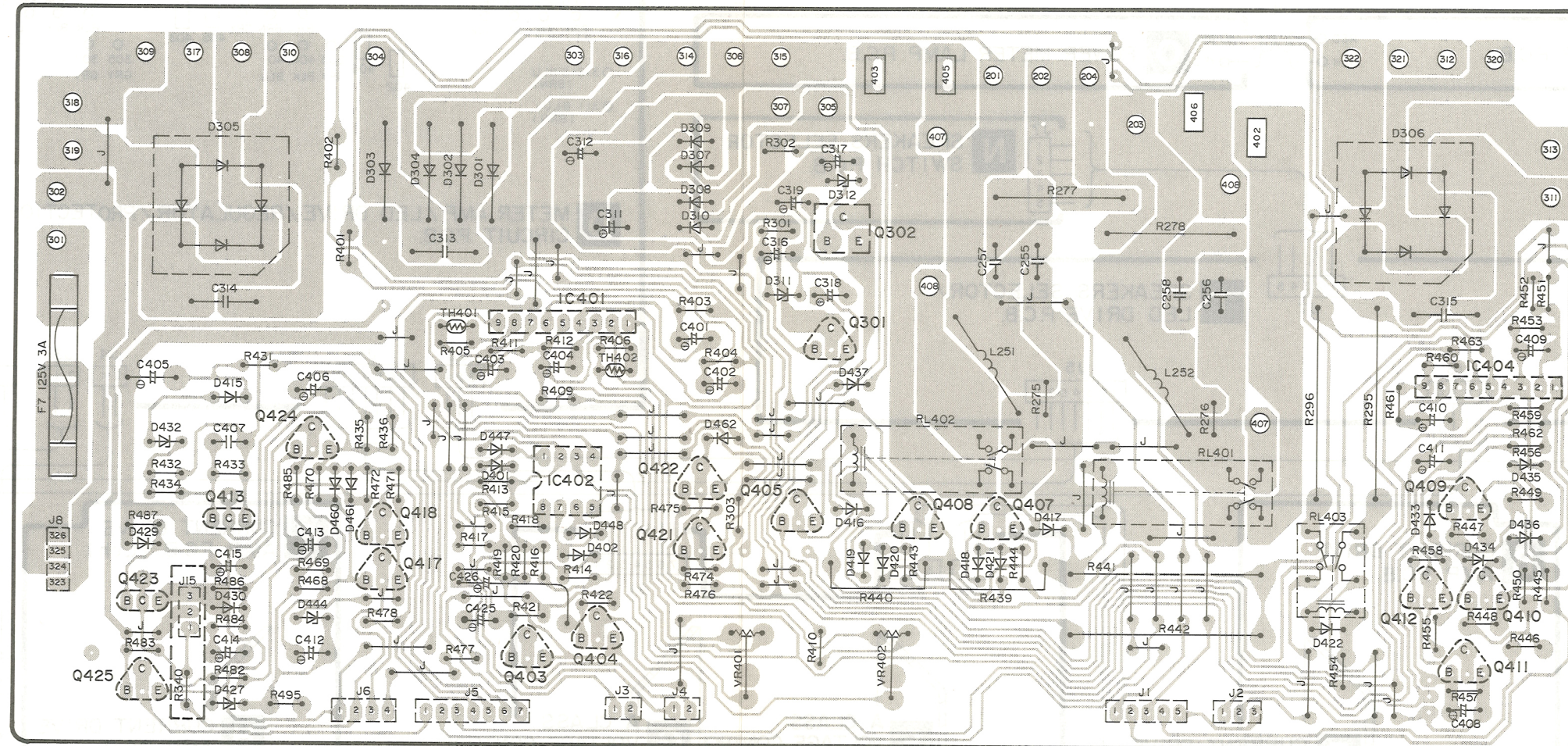
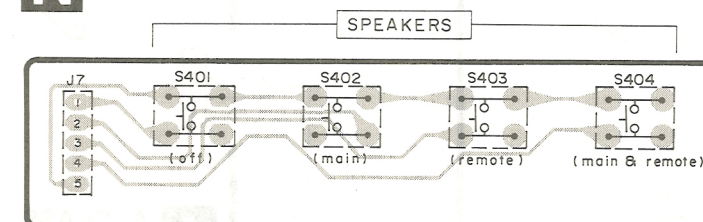
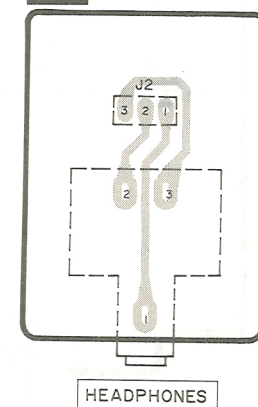
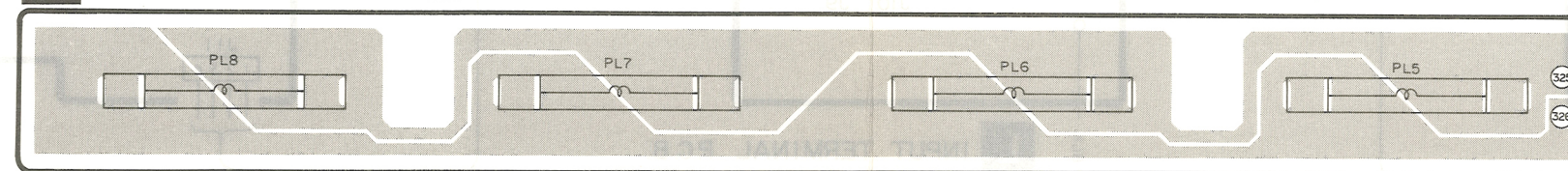
O POWER METER LAMP P.C.B.

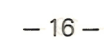


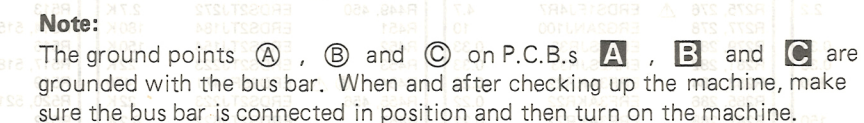
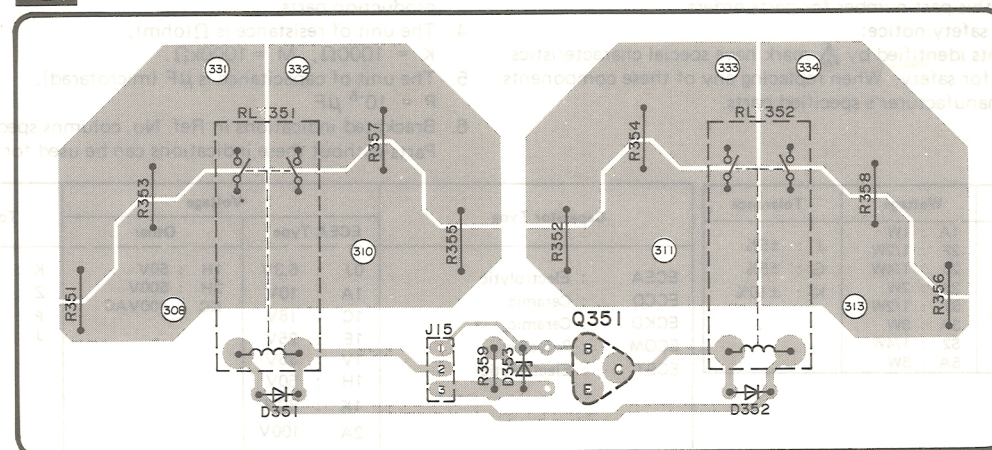
P POWER METER LAMP P.C.B.



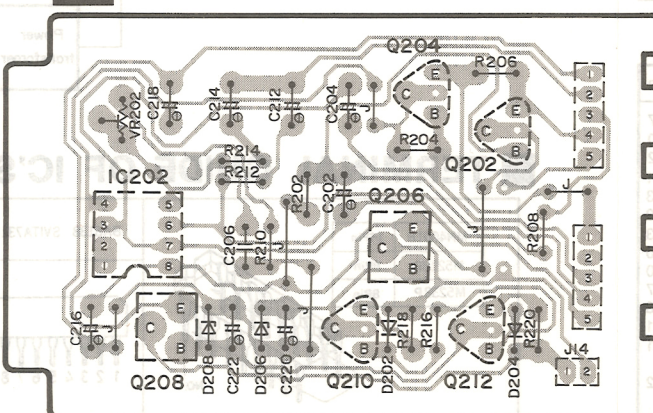
PEAKER TERMINAL P.C.B

**D** METER AMP / LED DRIVE / REGULATOR / PROTECTION CIRCUIT P.C.B.**N** SPEAKERS SELECTOR SWITCH P.C.B.**M** HEADPHONES P.C.B.**P** POWER METER LAMP P.C.B





E CURRENT DRIVE AMP. P.C.B.



RESISTORS & CAPACITORS

- Notes:**
- Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
 - Important safety notice:
Components identified by Δ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

- The "S" mark is service standard parts and may differ from production parts.
- The unit of resistance is Ω (ohm),
K = 1000 Ω , M = 1000k Ω .
- The unit of capacitance is μ F (microfarad).
P = 10⁻⁶ μ F.
- Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.

Resistor Type	Wattage	Tolerance
ERD : Carbon	1A : 1W	J : $\pm$ 5%
ERG : Metal Oxide	2F : 1/2W	G : $\pm$ 5%
ERO : Metal Film	25 : 1/4W	K : $\pm$ 10%
ERF : Non-flammable	2A : 2W	
ERX	S1 : 1/2W	
	3A : 3W	
	S2 : 1/4W	
	5A : 5W	

Capacitor Type	Voltage		Tolerance
	ECEA Type	Other	
ECEA : Electrolytic	0J : 6.3V	1H : 50V	K : $\pm$ 10%
ECCD : Ceramic	1A : 10V	2H : 500V	Z : +80%, -20%
ECKD : Ceramic	1C : 16V	KC : 400VAC	P : $\pm$ 100%
ECQM : Polyester	1E : 25V		J : $\pm$ 5%
ECET : Electrolytic	1V : 35V		
	1H : 50V		
	1K : 80V		
	2A : 100V		

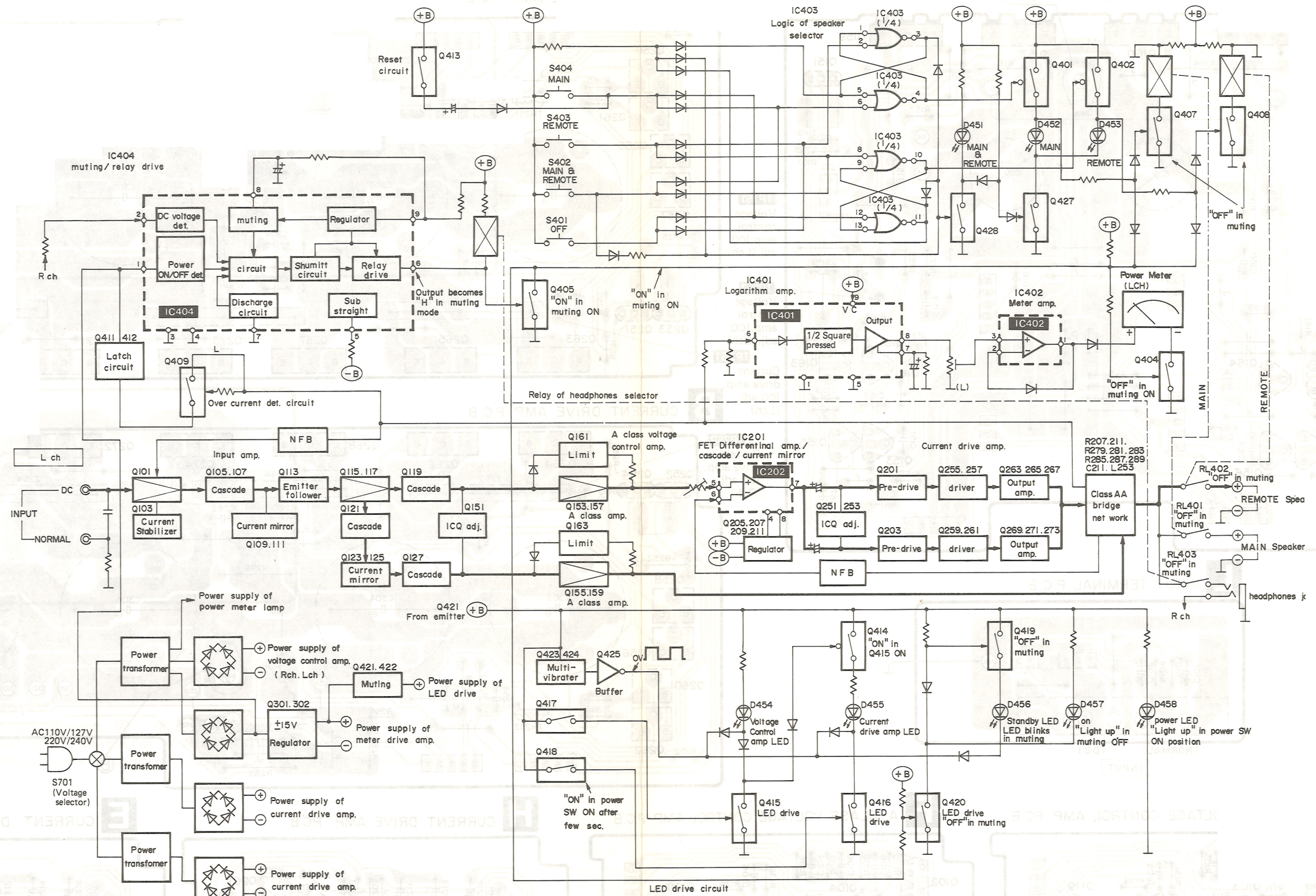
RESISTORS

Ref. No.	Part No.	Value	Ref. No.	Part No.	Value	Ref. No.	Part No.	Value	Ref. No.	Part No.	Value
R101, 102	ERDS2TJ332	3.3K	R201, 202	ERD25FJ332	3.3K	R301, 302	ERDS2TJ222	2.2K	R462	ERDS2TJ153	15K
R103, 104	ERDS2TJ224	220K	R203, 204	ERD25FJ332	3.3K	R303	ERDS2TJ222	2.2K	R463	ERDS2TJ392	3.9K
R105, 106	ERDS2TJ473	47K	R205, 206	ERD25FJ391	390	R340	ERDS2TJ472	4.7K	R468	ERDS2TJ394	390K
R107, 108	ERDS2TKG8200	820	R207, 208	ERDS2TJ392	3.9K	R351, 352	ERF5AJ220	22	R469	ERDS2TJ274	270K
R109, 110	ERDS2TKG2702	27K	R209, 210	ERDS2TJ102	1K	R353, 354	ERF5AJ220	22	R470	ERDS2TJ334	330K
R111, 112	ERDS2TJ272	2.7K	R211, 212	ERDS2TJ221	220	R355, 356	ERF5AJ220	22	R471	ERDS2TJ332	3.3K
R113, 114	ERDS2TJ102	1K	R213, 214	ERDS2TJ221	220	R357, 358	ERF5AJ220	22	R472	ERDS2TJ154	150K
R115, 116	ERDS2TJ563	56K	R215, 216	ERDS2TJ224	220K	R359	ERD25FJ560	56	R473	ERDS2TJ682	6.8K
R117, 118	ERDS2TJ223	22K	R217, 218	ERD25FJ271	270	R401, 402	ERDS1FJ392	3.9K	R474	ERDS2TJ392	3.9K
R119, 120	ERDS2TJ124	120K	R219, 220	ERD25FJ271	270	R403, 404	ERDS2TJ271	270	R475	ERDS2TJ223	22K
R121, 122	ERDS2TJ101	100	R251	ERDS2TJ472	4.7K	R405, 406	ERDS2TJ682	6.8K	R476	ERDS2TJ153	15K
R123, 124	ERDS2TJ681	680	R252	ERD25FJ472	4.7K	R409, 410	ERDS2TJ182	1.8K	R477	ERDS2TJ103	10K
R125, 126	ERDS2TJ681	680	R253, 254	ERDS2TJ472	4.7K	R411, 412	ERDS2TJ155	1.5M	R478, 479	ERDS2TJ223	22K
R127, 128	ERDS2TJ472	4.7K	R255, 256	ERDS2TJ472	4.7K	R413, 414	ERDS2TJ123	12K	R480, 481	ERDS2TJ473	47K
R129, 130	ERDS2TJ221	220	R257, 258	ERD2FCG681	680	R415, 416	ERDS2TJ154	150K	R482, 483	ERDS2TJ682	6.8K
R131, 132	ERDS2TJ470	47	R259, 260	ERD2FCG681	680	R417, 418	ERDS2TJ223	22K	R484, 485	ERDS2TJ682	6.8K
R133, 134	ERDS2TJ821	820	R261, 262	ERD25FJ487	4.7	R419, 420	ERDS2TJ102	1K	R486, 487	ERDS2TJ682	6.8K
R135, 136	ERDS2TJ102	1K	R263, 264	ERD25FJ487	4.7	R421, 422	ERDS2TJ104	100K	R489, 490	ERDS2TJ223	22K
R137, 138	ERDS2TJ102	1K	R265, 266	ERD25FJ487	4.7	R423, 424	ERDS2TJ473	47K	R492, 493	ERDS2TJ103	10K
R139, 140	ERDS2TJ563	56K	R267, 268	ERD25FJ487	4.7	R425, 426	ERDS2TJ473	47K	R494	ERDS2TJ473	47K
R141, 142	ERDS2TJ563	56K	R269, 270	ERD25FJ221	220	R431	ERDS2TJ681	680	R495	ERDS1FJ821	820
R143, 144	ERDS2TJ563	56K	R275, 276	ERDS1FJ487	4.7	R432	ERDS2TJ332	3.3K	R496	ERDS2TJ562	5.6K
R145, 146	ERDS2TJ272	2.7K	R277, 278	ERG2ANJ100	10	R433, 434	ERDS2TJ103	10K	R497	ERDS2TJ224	220K
R147, 148	ERDS2TJ101	100	R281, 282	ERX2SJR33	0.33	R435	ERDS2TJ223	22K	R501, 502	ERDS2TJ331	330
R149, 150	ERDS2TJ101	100	R283, 284	ERF3AKR22	0.22	R436	ERDS2TJ104	100K	R503	ERDS2TJ391	390
R151, 152	ERD2FCG471	470	R285, 286	ERF3AKR22	0.22	R439, 440	ERG2ANJ272	2.7K	R504, 505	ERDS2TJ331	330
R153, 154	ERDS2TJ182	1.8K	R287, 288	ERF3AKR22	0.22	R441, 442	ERG3ANJ122	1.2K	R506	ERDS2TJ391	390
R155, 156	ERD25FJ391	390	R289, 290	ERF3AKR22	0.22	R443, 444	ERDS2TJ183	18K	R507, 508	ERDS2TJ331	330
R157, 158	ERD25FJ2R2	2.2	R291, 292	ERG2SJR100	10	R445, 446	ERD25FJ151	150	R509	ERDS2TJ391	390
R159, 160	ERD25FJ2R2	2.2	R293, 294	ERDS1FJ487	4.7	R447, 448	ERD25FJ471	470	R510, 511	ERDS2TJ331	330
R161, 162	ERX1SJR33	0.33	R295, 296	ERG3ANJ331	330	R449, 450	ERDS2TJ272	2.7K	R512	ERDS2TJ331	330
R163, 164	ERX1SJR33	0.33				R451	ERDS2TJ184	180K	R513	ERDS2TJ471	470
R165, 166	ERD25FJ151	150				R452	ERDS2TJ154	150K	R514, 515	ERDS2TJ391	390
R167, 168	ERD25FJ151	150				R453	ERDS2TJ223	22K	R516	ERDS2TJ471	470
R169, 170	ERDS1FJ100	10				R454	ERD25FJ471	470	R517, 518	ERDS2TJ391	390
R171, 172	ERD25FJ100	10				R455, 456	ERDS2TJ223	22K	R519	ERDS2TJ151	150
R173, 174	ERX1ANJR22	0.22				R457	ERDS2TJ822	8.2K	R520, 521	ERDS2TJ181	180
						R458	ERDS2TJ473	47K	R522	ERDS2TJ181	180
						R459	ERDS2TJ223	22K	R523	ERDS2TJ471	470
						R460	ERDS2TJ822	8.2K	R524, 525	ERDS2TJ391	390
						R461	ERDS2TJ334	330K			

CAPACITORS

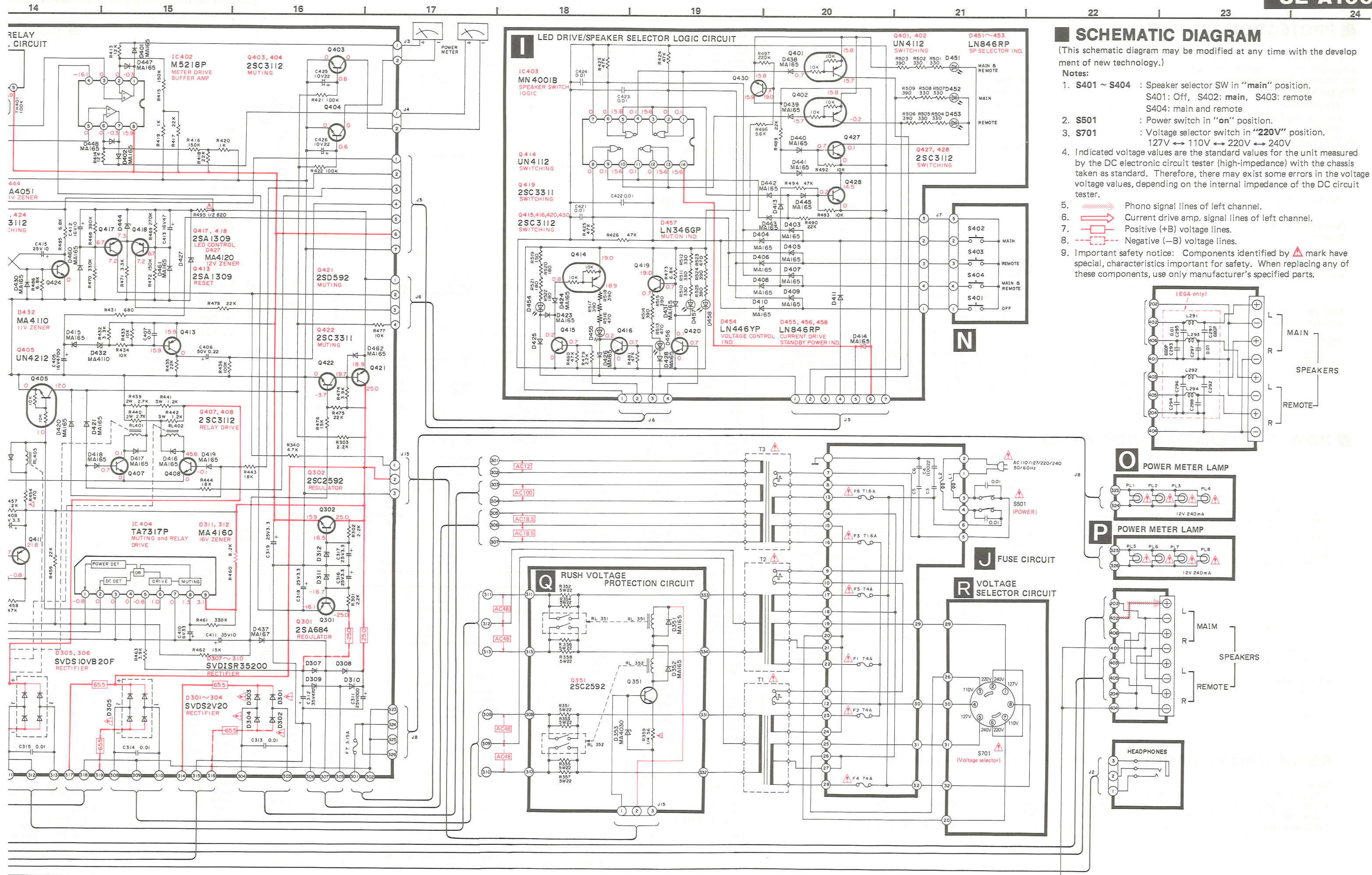
Ref. No.	Part No.	Value	Ref. No.	Part No.	Value	Ref. No.	Part No.	Value	Ref. No.	Part No.	Value
C1	ECKDKC103PF2	0.01	C205, 206	ECQM1H472JZ	0.0047	C295, 296	ECQM1H103JZ	0.01	C403, 404	ECEA1HUR47	0.47
C2	ECKDKC103PF2	0.01	C211, 212	ECEA1AU221	220	[EGA] only			C405	ECEA1CU472	4700
C3, 4	ECKDKC222MFZ	0.0022	C213, 214	ECEA1AU221	220	C297, 298	ECQM1H103JZ	0.01	C406	ECEA1HUR22	0.22
C5, 6	ECKDKC222MFZ	0.0022	C215, 216	ECEA1AU101	100	[EGA] only			C407	ECKD1H103ZF	0.01
C101, 102	ECEA1HU2R2	2.2	C217, 218	ECEA1AU101	100	C301, 302	ECET1KV103LU	10000	C408	ECEA1EU3R3	3.3
C103, 104	ECOD1H221K	220P	C219, 220	ECEA1AU330	33	C303, 304	ECET1KV103LU	10000	C409	ECEA1UJU101	100
C105, 106	ECEA1CU221	220	C221, 222	ECEA1AU330	33	C305, 306	ECET1KV103LU	10000	C410	ECEA1UJU330	33
C107, 108	ECOD1H120KC	12P	C251, 252	ECKD1H681KB	680P	C307, 308	ECET1KV103LU	10000	C411	ECEA1VU100	10
C109, 110	ECKD1H391KB	390P	C253, 254	ECKD1H681KB	680P	C309, 310	ECES1KU562U	5600	C412	ECEA1CU100	10
C151, 152	ECOD2H101K	100P	C255, 256	ECQM1H104JZ	0.1	C311	ECEA1VU102	1000	C413	ECEA1CU470	47
C153, 154	ECOD2H101K	100P	C257, 258	ECQM1H104JZ	0.1	C312	ECEA1VU471	470	C414, 415	ECEA1EU100	10
C155, 156	ECQM1H472JZ	0.0047	C259, 260	ECQM1H104JZ	0.1	C313	ECKD2H103PE	0.01	C421, 422	ECKD1H103ZF	0.01
C157, 158	ECEA2AU100	10	C261, 262	ECQM1H104JZ	0.1	C314, 315	ECQE2104KZ	0.1	C423, 424	ECKD1H103ZF	0.01
C159, 160	ECEA2AU100	10	C291, 292	ECKD1H681KB	680P						
C201, 202	ECEA1EU3R3	3.3	[EGA] only			C316, 317	ECEA1EU3R3	3.3	C425, 426	ECEA1AU220	22
C203, 204	ECEA1EU3R3	3.3	C293, 294	ECKD1H681KB	680P	C318, 319	ECEA1EU3R3	3.3			
			[EGA] only			C401, 402	ECEA1HU47	4.7			

BLOCK DIAGRAM



TERMINAL GUIDE OF IC'S TRANSISTORS, AND DIODES

MN4001B 14Pin M5218P 8Pin M5238P 8Pin	BA6138 SVTA7317P	2SK389, 2SA1301, 2SC3280	2SC2592 2SA1112	2SC1815, 2SC3112 2SA1015, 2SC2631 2SA1123, 2SA1370 2SC3467, 2SA684 2SD592, 2SD1512 2SB1036,	2SA1309 2SC3311	UN4112	UN4212	MA4056M MA4051M MA4082M MA4120M MA4160M MA4100M	MA165 MA167 MA29WA	SVDS2V20 1SR35200	SVDS10VB20F	LN346GP LN446YP LN846RP
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PROTECTION CIRCUITRY

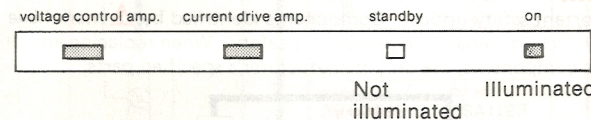
The protection circuitry functions under the following conditions, the “on” operation indicator illumination stops, and the “standby” indicator flashes.

Probable causes: E08AA01C E08BB03A E08BD03A

1. The protection circuitry has functioned because the positive (+) and negative (–) speaker connection wires are short-circuited.
2. The protection circuitry has functioned due to a malfunction of other equipment (such as the control amplifier, etc.), thus resulting in a DC component being applied to the input of this unit.
3. The protection circuitry has functioned because of a malfunction of this unit.

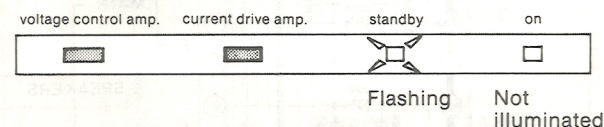
During normal operation

(Sound is heard from speakers)



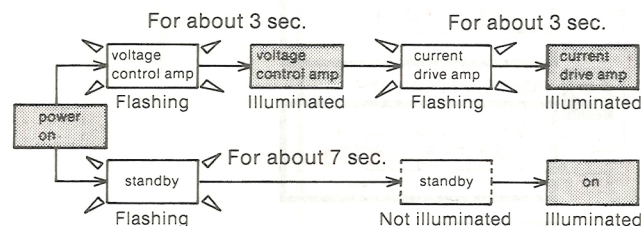
When protection circuitry functions

(No sound is heard from speakers)



HOW TO OPERATION INDICATORS

These indicators illuminate to indicate the operation condition of this unit.



voltage control amp:

When the power is switched ON, illumination begins after flashing for about three seconds.

This indicates that the voltage-control amplifier can be used.

current drive amp:

When the voltage-control amplifier indicator illuminates, illumination begins after flashing for about three seconds.

This indicates that the current-drive amplifier can be used.

REPLACEMENT PARTS LIST (Electric, cabinet & chassis parts)

Notes:

1. Part numbers are indicated on most mechanical parts. Please use this part number for parts order.
2. Important safety notice: Components identified by Δ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.
4. The “ $\oplus$ ” mark is service standard parts and may differ from production parts.
5. The parenthesized numbers in the column of description stand for the quantity per set.

If the protection circuitry functions, the following steps should be taken.

1. First check whether or not speaker connection wires have short circuited.

If they have, be sure to first switch OFF the power. Then, after correcting the connections, once again switch ON the power.

2. If the speaker connection wires are not short-circuited ...

- ① Turn off the power.
- ② Disconnect the control amplifier and speaker system connections.
- ③ Turn on the power once again.

If at this time the “standby” indicator continues to flash, the problem is probably with this unit. Please consult with the store where the unit was purchased or with a nearby Authorized Service Center (list enclosed).

3. If the steps taken in 2. above result in illumination of the “on” indicator ...

- ① Turn off the power.
- ② Reconnect the connections of the input terminals from “DC” to “NORMAL”, and connect the speaker systems.
- ③ Turn on the power once again.

If, at this time, the “on” indicator illuminates, there may be a malfunction of the control amplifier. If the “standby” indicator continues to flash, the problem is probably with the speaker system. Please consult with the store where the speaker systems were purchased or with a nearby Authorized Service Center (list enclosed).

standby:

This indicator flashes for about seven seconds after the power is switched ON; the flashing stops when the circuitry is in the normal operating condition.

Also flashes when the following abnormal conditions are detected.

- ① If, during the approximately seven seconds of flashing after the power is switched ON, a DC component is detected in the input, the protection circuitry is activated and the indicator flashes continuously.
- ② If, during use, the speaker connection wires become short-circuited.

on:

Illuminates simultaneously when the “standby” indicator stops illumination.

Indicates that the relay is in the ON condition and that there has been a change to the condition in which sound can be heard from the speaker systems.

Note that this indicator's illumination will stop if the “standby” indicator is flashing.

Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC201, 202	M5238P	Integrated Circuit
IC401	BA6138	Integrated Circuit
IC402	M5218P	Integrated Circuit
IC403	MN4001B	Integrated Circuit
IC404	SVTA7317P	Integrated Circuit
TRANSISTORS		
Q101, 102	2SK389—GR	Transistor (FET)
Q103~108	2SD1512R	Transistor
Q109~112, 117, 118	2SA1309Q	Transistor
Q113, 114	2SB1036R	Transistor
Q115, 116, 119~122, 155, 156	2SA1370—D	Transistor
Q123~126, 419	2SC3311—Q	Transistor
Q127, 128, 153, 154	2SC3467—D	Transistor
Q151, 152, 201, 202, 251, 252	2SC1815Y	Transistor
Q157, 158, 263~268	2SC3280R	Transistor
Q159, 160, 269~274	2SA1301R	Transistor
Q161, 162, 412, 422	2SC3311—Q	Transistor
Q163, 164, 411, 413, 417, 418	2SA1309Q	Transistor
Q203, 204, 253, 254	2SA1015Y	Transistor
Q205, 206, 255~258	2SC2592—R	Transistor
Q207, 208, 259~262	2SA1112—R	Transistor
Q209, 210	2SA1123—R	Transistor
Q211, 212	2SC2631—R	Transistor
Q301	2SA684—QNC	Transistor
Q302	2SC2592—R	Transistor
Q351	2SC2592—R	Transistor
Q401, 402, 414	UN4112	Transistor
Q403, 404, 407, 408, 415, 416, 420, 423~425, 427, 428, 430	2SC3112	Transistor
Q405	UN4212	Transistor
Q409, 410	2SD1512R	Transistor
Q421	2SD592ANCQ	Transistor
DIODES		
D101~104, 444	MA4051M	Diode
D105~110, 151~154, 401~411, 413~422, 423~426, 428, 429, 430, 431, 438~443, 445, 447, 448, 460~462	MA165	Diode
D161, 162	MA4056—M	Diode
D201~204	MA29WA	Diode
D205~208	MA4082M	Diode
D301~304	Δ SVDS2V20	Rectifier
D305, 306	Δ SVDS10VB20F	Rectifier
D307~310	Δ 1SR35200	Rectifier
D311, 312	MA4160M	Diode
D351, 352	MA165	Diode
D353	MA4030M	Diode
D427	MA4120—M	Diode
D432	MA4100M	Diode
D433~437	MA167	Diode
D451~453, 455, 456, 458	LN846RP	Diode (L.E.D.)
D454	LN446YP	Diode (L.E.D.)
D457	LN346GP	Diode (L.E.D.)
COILS		
L1, 2	ELQ050D15	Choke
L251, 252	SLQY18G—10	Choke
L253, 354	SLQY07G—30	Choke
L291~294	SLQY07G—30	Choke
[EGA] only		
TRANSFORMERS		
T1	Δ SLT5R67—1	Power Transformer
T2	Δ SLT5R67—2	Power Transformer

Ref. No.	Part No.	Description
T3	Δ SLT5N458	Power Transformer
VARIABLE RESISTORS		
VR151, 152	EVNK6AA00B52	Variable Resistor, 500 Ω (B)
VR201, 202	EVNK0AA00B52	Variable Resistor, 500 Ω (B)
VR251, 252	EVNK6AA00B23	Variable Resistor, 2k Ω (B)
VR401, 402	EVNK6AA00B14	Variable Resistor, 10k Ω (B)
THERMISTORS		
TH251, 252, 401, 402	ERTD2ZHK104S	100k Ω
COMPONENT COMBINATIONS		
Z251~256	ERF3GBKR22N	0.22 Ω $\times$ 2
RELAYS		
RL351, 352	SSY129	Speaker Headphone
RL401, 402	SSY126	Speaker Headphone
RL403	SFDYGS4237P	Speaker Headphone
LAMPS		
PL1~8	Δ XAMS19P	Meter
FUSES		
F1, 2 [EK]	Δ XBA2C40TB0	250V, T 4 A
F1, 2 [Other]	Δ XBA2C40TR0	250V, T 4 A
F3 [EK]	Δ XBA2C16TB0	250V, T 1.6 A
F3 [Other]	Δ XBA2C16TR0	250V, T 1.6 A
F4, 5 [EK]	Δ XBA2C40TB0	250V, T 4 A
F4, 5 [Other]	Δ XBA2C40TR0	250V, T 4 A
F6 [EK]	Δ XBA2C16TB0	250V, T 1.6 A
F6 [Other]	Δ XBA2C16TR0	250V, T 1.6 A
F7 [EK]	Δ XBA2C31TB0	250V, T 3.15 A
F7 [Other]	Δ XBA2C31TR0	250V, T 3.15 A
SWITCHES		
S401~404	SSG13	Speaker Selector
S501	Δ ESB9997S	Power Source
S701	Δ ESE37263	Voltage Selector
METER		
SSMEA100—KN Power Meter		

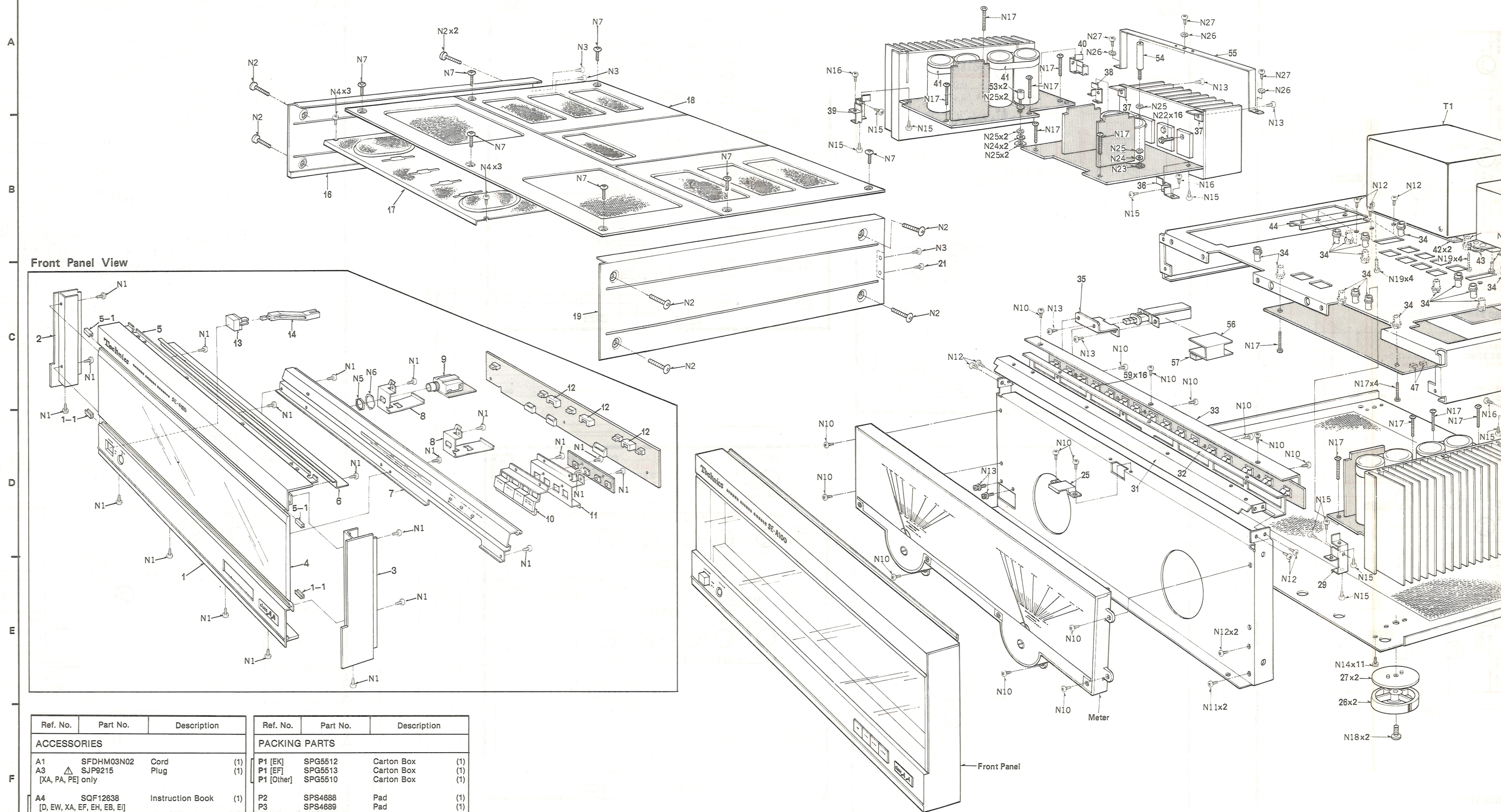
Ref. No.	Part No.	Description
CABINET and CHASSIS PARTS		
1	SGWEA100—KM	Panel Ass'y (Down) (1)
1-1	[SHG6379	Rubber (2)
2	SGXEA100—KM	Ornament Ass'y (1)
3	SGXEA100—KM1	Ornament Ass'y (Right) (1)
4	SGUEA100—KN	Transparent Plate (Glass) (1)
5	SGWEA100—KN1	Panel Ass'y (Upper) (1)
5-1	[SHG6379	Rubber (2)
6	SUWEA100—KN	Bracket (1)
7	SGWEA100—KN2	Indicator Panel Ass'y (1)
8	SUW2981	Bracket (2)
9	SJJ63B	Jack (1)
10	SBCEA100—KN	Button Ass'y (1)
11	SUW2980	Bracket (1)
12	SHG6382	Rubber (3)
13	SBC666—3	Button, Power Switch (1)
14	SUB161—1	Connection Rod, Power Switch (1)
16	SUHEA100—KM	Side Plate (Left) (1)
17	SMN1997	Net (1)
18 [EK]	SKCEA100—KK	Upper Cover (1)
18 [Other]	SKCEA100—KD	Upper Cover (1)
19	SUHEA100—KM1	Side Plate (Right) (1)

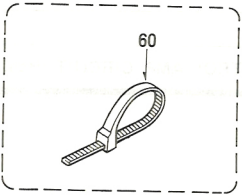
Ref. No.	Part No.	Description
25	SUW2987	Bracket (1)
26	SKL295	Foot (4)
27	SHG3018	Rubber (4)
28 [EK]	SKUEA100—KK	Bottom Board (1)
28 [Other]	SKU11370	Bottom Board (1)
29	SUW2977	Bracket (1)
30	SUW2977—1	Bracket (1)
31	SUW1621—1	Bracket (1)
32	SMPEA100—KN	Plate (1)
33	SMZ319	Plate (1)
34	SHE181	Spacer (24)
35	SUW2827—2	Bracket (1)
36	SUW2978—1	Bracket (1)
37	SUW2905—1	Bracket (2)
38	SUW2978	Bracket (2)
39	SUW2977—1	Bracket (1)
40	SUW2977	Bracket (1)
41	SHS2445	Sheet (4)
42	SHG6355	Rubber (4)
43	SHG6137	Rubber (6)
44	SUW2988	Bracket (2)
45	SJF4817	Terminal Board (Speaker) (1)
46	SJF3431—9A	Terminal Board (Input) (1)
47	SJT347	Fuse Holder (14)
48 [D]	SGPEA100—KD	Rear Panel (1)
48 [EW]	SGPEA100—KW	Rear Panel (1)
48 [EK]	SGPEA100—KK	Rear Panel (1)
48 [XL]	SGPEA100—KL	Rear Panel (1)
48	SGPEA100—KX	Rear Panel (1)
[XA, PA, PE]	SGPEA100—KF	Rear Panel (1)
48	[EF, EH, EB, EI, EGA]	
49	SKL241	Foot (4)
50 [EW]	Δ SJA111	AC Cord (1)
50 [EK]	Δ QFC1205M	AC Cord (1)
50 [XL]	Δ SJAG23	AC Cord (1)
50	Δ SJA121	AC Cord (1)
[XA, PA, PE]	SJA123	AC Cord (1)
50	Δ [Other]	
51	SHR127	Bushing AC Cord (1)
[EW, XL, XA, PA, PE]	SHR131	Bushing AC Cord (1)
51 [Other]		
53	SUX41	Spacer (2)
54	SUX40	Spacer (1)
55	SMT4	Bracket (1)
56	SMX908	Cover (1)
57	SHG6388	Rubber (1)
59	SJT345	Lamp Holder (16)
60	SHR301	Clamp (20)

SCREWS, WASHERS and NUTS

N1	XTB3+8FFZ	Tapping, $\oplus 3 \times 8$ (24)
N2	XSS5+12F1S	$\oplus 5 \times 12$ (8)
N3	XTBS3+8FFZ1	Tapping with Detent, $\oplus 3 \times 8$ (4)
N4	XTW3+8HFZ	Tapping with Washer, $\oplus 3 \times 8$ (6)
N5	$\oplus$ XNS12	Nut, $\phi 12$ (1)
N6	SNE59—1	Washer (Headphone) (1)
N7	SNE2095—6	Upper Cover (7)
N10	XTB3+8FFZ	Tapping, $\oplus 3 \times 8$ (12)
N11	XTBS3+8FFZ1	Tapping with Detent, $\oplus 3 \times 8$ (4)
N12	XTB4+8FFZ	Tapping, $\oplus 4 \times 8$ (18)
N13	XYN3+C8FZS	$\oplus 3 \times 8$ (6)
N14	XTB4+18FFZ	Tapping, $\oplus 4 \times 18$ (11)
N15	XTW3+8T	Tapping with Washer, $\oplus 3 \times 8$ (16)
N16	XTW3+8LFR	Tapping with Washer, $\oplus 3 \times 8$ (6)
N17	XTV3+20F	Tapping, $\oplus 3 \times 20$ (24)
N18	XTB4+16FFZ	Tapping, $\oplus 3 \times 16$ (4)
N19	XTB4+10FFZ	Tapping, $\oplus 4 \times 10$ (12)
N20	XTB3+8GFZ	Tapping, $\oplus 3 \times 8$ (6)
N21	XTB4+12FFZ	Tapping, $\oplus 4 \times 12$ (4)
N22	SNE2117—1	Transistor (16)
N23	$\oplus$ XNG4ES	Nut, $\phi 4$ (3)
N24	$\oplus$ XWA4B	Washer, $\phi 4$ (3)
N25	$\oplus$ XWC4B	Washer, $\phi 4$ (6)
N26	$\oplus$ XWC3B	Washer, $\phi 3$ (3)
N27	XYN3+C8S	$\oplus 3 \times 8$ (3)
N29	XYN3+C8FZS	$\oplus 3 \times 8$ (2)

EXPLODED VIEWS





Stereo Power Amplifier

SE-A100

DEUTSCH

- This booklet contains the specifications and adjusting procedures for SE-A100, written in German, French and Spanish.
- File this manual together with the SE-A100 service manual (Order No. HAD8601326C9).
- Das vorliegende Büchlein enthält die technische Daten und Justierverfahren für den SE-A100 in deutscher, französischer und spanischer Sprache.
- Bewahren Sie das Büchlein zusammen mit der Bedienungsanleitung für den SE-A100 auf (Bestell-Nr. HAD8601326C9).
- Cette brochure contient les spécifications et les procédures de mises au point pour le SE-A100, écrites en allemand, en français et en espagnol.
- Classer ce manuel en meme temps qu'avec le manuel de service du SE-A100 (N° d'ordre : HAD8601326C9).
- Este librito contiene la especificaciones y procedimientos de ajuste para SE-A100, escritos en alemán, francés y español.
- Guardar este manual juntamente con el manual de servicio de SE-A100 (Pedido N° HAD8601326C9).

DEUTSCH

■ TECHNISCHE DATEN (DIN 45 500)

■ VERSTÄRKERTEIL

Dauerton-Ausgangsleistung bei 20 Hz ~ 20 kHz	
beide Kanäle ausgesteuert	2 × 240W (4 Ω) 2 × 170W (8 Ω)
Dauerton-Ausgangsleistung bei 40 Hz ~ 16 kHz	
beide Kanäle ausgesteuert	2 × 240W (4 Ω) 2 × 170W (8 Ω)
Dauerton-Ausgangsleistung bei 1 kHz	
beide Kanäle ausgesteuert	2 × 260W (4 Ω) 2 × 180W (8 Ω)
Gesamtklirrfaktor	
Nennleistung bei 20 Hz ~ 20 kHz	0,002% (4 Ω) 0,0007% (8 Ω)
Nennleistung bei 40 Hz ~ 16 kHz	0,002% (4 Ω) 0,0007% (8 Ω)
Nennleistung bei 1 kHz	0,0004% (4 Ω) unmeßbar, unter 0,0002% (8 Ω)
halbe Nennleistung bei 20 Hz ~ 20 kHz	0,0007% (8 Ω)
halbe Nennleistung bei 1 kHz	unmeßbar, unter 0,0002% (8 Ω)
–26 dB Leistung bei 1 kHz	0,001% (4 Ω)
50 mW Leistung bei 1 kHz	0,003% (4 Ω)
Intermodulationsfaktor	
Nennleistung bei 250 Hz: 8 kHz = 4:1, 4 Ω	0,002%
Nennleistung bei 60 Hz: 7 kHz = 4:1, nach SMPTE, 8 Ω	0,002%
TIM (Intermodulationsverzerrung)	
Leistungsbandbreite	unmeßbar
beide Kanäle ausgesteuert bei –3 dB (T.H.D. 0,01%)	5 Hz ~ 100 kHz (8 Ω)
Restbrumm und Geräusch	0,3 mV
Dämpfungsfaktor	50 (4 Ω), 100 (8 Ω)

Eingangsempfindlichkeit und -impedanz	1,0 V/47 kΩ
Geräuschspannungsabstand	110 dB (120 dB nach IHF, A)
Frequenzgang	20 Hz ~ 20 kHz, +0 dB, –0,1 dB 0,8 Hz ~ 150 kHz, +0 dB, –3 dB
Kanalabweichung (250 Hz ~ 6300 Hz)	0,5 dB
Übersprechdämpfung (1 kHz)	60 dB
Kopfhörerpegel und -impedanz	870 mV/330 Ω
Lautsprecherimpedanz	
MAIN oder REMOTE	4 Ω ~ 16 Ω
MAIN und REMOTE	8 Ω ~ 16 Ω
Instrument	
Anzeigebereich	0,0001 W ~ 300 W (8 Ω) –60 dB ~ +2 dB (logarithmisch)
Frequenzbereich (Ablesegenauigkeit)	±3 dB (über –40 dB) ±5 dB (unter –40 dB)
Ansprechzeit	100 µs
Rückkehrzeit (0 dB → –20 dB)	300 ms

■ ALLGEMEINE DATEN

Leistungsaufnahme	1350 W
Netzspannung	Wechselstrom 50 Hz/60 Hz, 110V/127V/220V/240V
Abmessungen (B×H×T)	430 × 209 × 475 mm
Gewicht	31,2 kg

Bemerkung:
Der Gesamtklirrfaktor wurde mit einem digitalen Rauschspektrometer (Anlage H.P. 3045) gemessen.

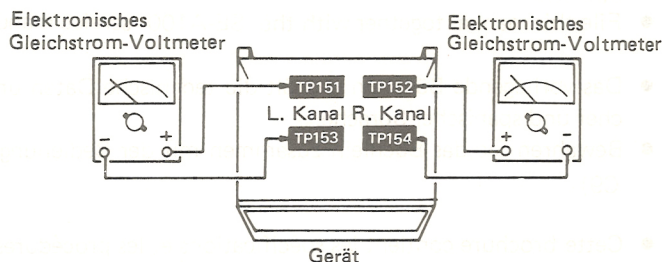
MESSUNGEN UND JUSTIERUNGE

Verwendende Geräte

- Elektronisches Wechsel- und Gleichstrom-Voltmeter
- Tonfrequenz-Oszillators
- Widerstand oder Lautsprecher (8Ω , 100W)

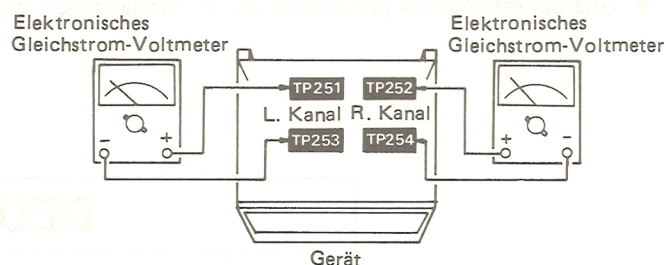
JUSTIERUNG DER SPANNUNGSREGELUNG (V) UND VERSTÄRKUNGS-LEERLAUF (ICQ)

1. Anschlußverbindungen wie gezeigt vornehmen.
(Das Gleichspannungs-Voltmeter an beide Kanäle anschließen.)
2. Die (V)-Verstärker-Justierregler (**VR151**, **VR152**) vollständig entgegen dem Uhrzeigersinn drehen.
3. Das Gerät einschalten, wenn es kalt ist, und 30 Sekunden später **VR151** und **VR152** so justieren, daß die Spannung **3mV** beträgt. Ebenfalls überprüfen, daß die Spannung nach Ablauf von **10 – 15** Minuten zwischen **10 – 18mV** (Standardwert ist **12mV**) liegt.
(Nach Ablauf von **60** Minuten: unter **50mV**)



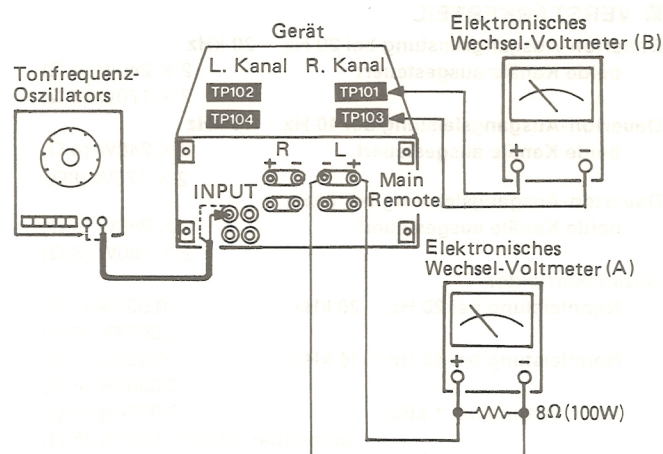
JUSTIERUNG VON STROMANTRIEB (C) UND VERSTÄRKUNGS-LEERLAUF (ICQ)

1. Anschlußverbindungen wie gezeigt vornehmen.
(Das Gleichspannungs-Voltmeter an beide Kanäle anschließen.)
2. Die (C)-Verstärker-Justierregler (**VR251**, **VR252**) vollständig entgegen dem Uhrzeigersinn drehen.
3. Das Gerät einschalten, wenn es kalt ist, und 30 Sekunden später **VR251** und **VR252** so justieren, daß die Spannung **0,7mV** beträgt. Ebenfalls überprüfen, daß die Spannung nach Ablauf von **10 – 15** Minuten **2 – 4mV** (Standardwert ist **2,5mV**) beträgt. (Nach Ablauf von **60** Minuten: unter **20mV**)



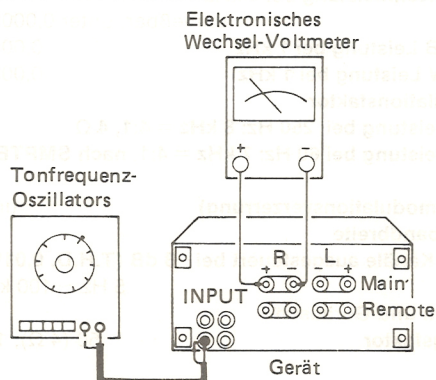
JUSTIERUNG DER BRÜCKENBALANCE

1. Anschlußverbindungen wie gezeigt vornehmen.
2. **VR201** (L. Kanal) und **VR202** (R. Kanal) in die Mittenposition einstellen, bevor das Gerät eingeschaltet wird.
3. Ein 1kHz-Signal an den Eingangsanschluß anlegen, so daß die Ausgangsspannung des Lautsprecher-Anschlusses **10V** beträgt.
(Sie kann mit dem Dämpfungswiderstand des Tonfrequenz-Oszillators verändert werden.)
4. **VR201** so justieren, daß die Spannung im 3mV-Bereich des elektronischen Wechselstrom-Voltmeters (B) minimal wird.
5. Auch für den Rechten Kanal ist die Anschlußverbindung zu ändern und die gleiche Justierung mittels **VR202** durchzuführen.



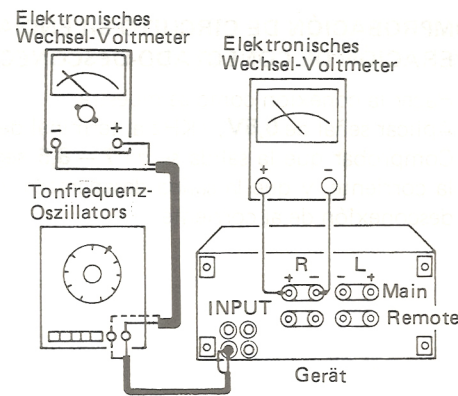
JUSTIERUNG DES LEISTUNGSMETERS

1. Anschlußverbindungen wie gezeigt vornehmen.
2. **VR401** (L. Kanal) und **VR402** (R. Kanal) in die Mittenposition einstellen und das Gerät einschalten.
3. Vor der Justierung ist sicherzustellen, daß das Leistungsmeter mechanisch auf den Nullpunkt justiert ist.
4. 1kHz-Signal an den Eingangsanschluß anlegen, so daß die Ausgangsspannung vom Lautsprecheranschluß **28,3V** beträgt.
(Sie kann mit dem Dämpfungswiderstand des Tonfrequenz-Oszillators verändert werden.)
5. **VR401** (L. Kanal) und **VR402** (R. Kanal) so justieren, daß das Leistungsmeter **100W** anzeigt.



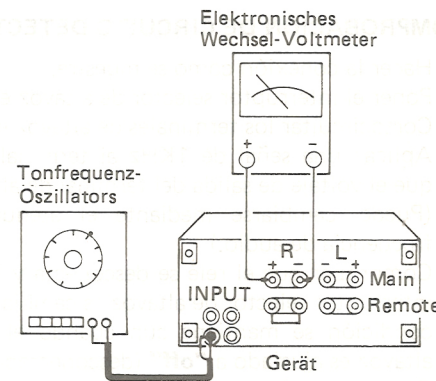
PRÜFUNG DES STUMMABSTIMMSCHALTUNGS-BETRIEBS BEI EIN- UND BEI AUSGESCHALTETEM GERÄT

1. Anschlußverbindungen wie gezeigt vornehmen.
2. 1kHz-Signal, **0,5V** an den Eingangsanschluß anlegen.
3. Überprüfen, ob die Ausgangsleistung **7 – 8,5** Sekunden nach Einschalten der Stromzufuhr anliegt und beim Ausschalten der Stromzufuhr sofort abfällt.



ÜBERPRÜFUNG DER ÜBERLASTUNGS-DETEKTIONS-SCHALTUNG

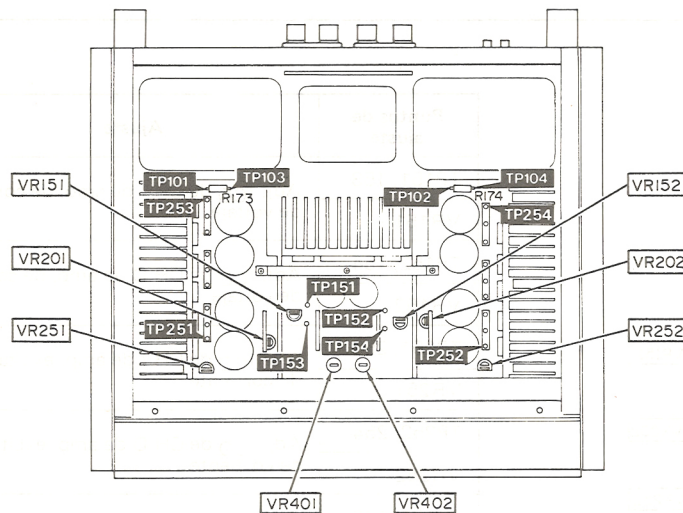
1. Anschlußverbindungen wie gezeigt vornehmen.
2. Den Lautsprecher-Wahlschalter auf **“main”** einstellen.
3. Die Lautsprecher-Anschlüsse auf der **“remote”**-Seite kurz-schließen.
4. 1kHz-Signal an den Eingangsanschluß anlegen, so daß die Ausgangsspannung des Lautsprecheranschlusses **1,2V** beträgt. (Sie kann mit dem Dämpfungswiderstand des Tonfrequenz-Oszillators verändert werden.)
5. Überprüfen, ob das Relais ausschaltet und die Ausgangsleistung stoppt, wenn der Lautsprecher-Wahlschalter auf **“remote”** gestellt wird, und daß dieser Zustand auch bei Einstellung des Lautsprecher-Wahlschalter auf **“off”** beibehalten wird.
6. Die gleiche Prüfung auf für den linken Kanal durchführen.



Anmerkung

- * Die Schutzschaltung jedes Kanals separat überprüfen.
- * Falls das Schutzrelais aktiviert wird, stellt es sich nicht selbst zurück. Daher ist die Stromzufuhr aus- und dann wieder einzuschalten.
- * Wenn die Schutzschaltung in Betrieb gesetzt worden ist, blinkt die Anzeige “stand by”.

• Zujustierende punkte



Zujustierende Punkte	Justierungen
TP151, 153 VR151	L. Kanal ICQ-Justierung des Spannungsregelungs-Verstärkers
TR152, 154 VR152	R. Kanal ICQ-Justierung des Spannungsregelungs-Verstärkers
TP251, 253 VR251	L. Kanal ICQ-Justierung des Stromantriebs-Verstärkers
TP252, 254 VR252	R. Kanal ICQ-Justierung des Stromantriebs-Verstärkers
TP101, 103 VR201	L. Kanal Brücken-Balance-Justierung
TP102, 104 VR202	R. Kanal Brücken-Balance-Justierung
VR401 VR402	L. Kanal Leistungsmeter-Justierung R. Kanal Leistungsmeter-Justierung

FRANÇAIS

■ CARACTERISTIQUES (DIN 45 500)

■ SECTION AMPLIFICATEUR

Puissance de sortie continue de 20 Hz~20 kHz,
les deux canaux en circuit

2 × 240W (4Ω)
2 × 170W (8Ω)

Puissance de sortie continue de 40 Hz~16 kHz,
les deux canaux en circuit

2 × 240W (4Ω)
2 × 170W (8Ω)

Puissance de sortie continue à 1 kHz
les deux canaux en circuit

2 × 260W (4Ω)
2 × 180W (8Ω)

Distorsion harmonique totale	
à puissance nominale (20 Hz~20 kHz)	0,002% (4Ω) 0,0007% (8Ω)
à puissance nominale (40 Hz~16 kHz)	0,002% (4Ω) 0,0007% (8Ω)
à puissance nominale (1 kHz)	0,0004% (4Ω) infiniment petite, moins que 0,0002% (8Ω)
à demi-puissance (20 Hz~20 kHz)	0,0007% (8Ω)
à demi-puissance (1 kHz)	infiniment petite, moins que 0,0002% (8Ω)
puissance de -26 dB à 1 kHz	0,001% (4Ω)
puissance de 50 mW à 1 kHz	0,003% (4Ω)

Distorsion d'intermodulation	
à puissance nominale à 250 Hz: 8 kHz=4:1, 4Ω	0,002%
à puissance nominale à 60 Hz: 7 kHz=4:1, SMPTE, 8Ω	0,002%

TIM (distorsion d'intermodulation transitoire) infiniment petite

Réponse de fréquences	
les deux canaux en circuit, -3 dB (T.H.D. 0,01%)	5 Hz~100 kHz (8Ω)

Bruit et ronflement résiduels	0,3 mV
Coefficient d'amortissement	50 (4Ω), 100 (8Ω)

Sensibilité et impédance d'entrée	1,0 V/47kΩ
Signal/Bruit	110 dB (120 dB, IHF, A)

Réponse de fréquence	20 Hz~20 kHz, +0 dB, -0,1 dB 0,8 Hz~150 kHz, +0 dB, -3 dB
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Equilibrage des canaux, 250 Hz~6,300 Hz	0,5 dB
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Séparation des canaux, 1 kHz	60 dB
Niveau de sortie des casques et impédance	870 mV/330Ω
Impédance de charge	

PRINCIPALE ou AUXILIAIRE (MAIN or REMOTE)

4Ω~16Ω

PRINCIPALE et AUXILIAIRE (MAIN and REMOTE)

8Ω~16Ω

Indicateur	
gamme de lecture	0,0001 W~300 W (8Ω) -60 dB~+2 dB (compression logarithmique)

réponse de fréquence (précision de lecture)	±3 dB (plus que -40 dB) ±5 dB (moins que -40 dB)
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temps d'attaque	100 μsec.
durée de rétablissement (0 dB → -20 dB)	300 msec.

■ DIVERS

Consommation 1350W

Alimentation CA 50 Hz/60 Hz, 110V/127V/220V/240V

Dimensions (L×H×Pr) 430 × 209 × 475 mm

Poids 31,2 kg

Remarques:

• On mesure la distorsion harmonique totale au moyen d'un analyseur de spectre digital (Système H.P. 3045).

• La Société PANASONIC-FRANCE, importateur du matériel MATSUSHITA-ELECTRIC déclare que cet appareil est conforme aux prescriptions de la directive 76/889/C.E.E.

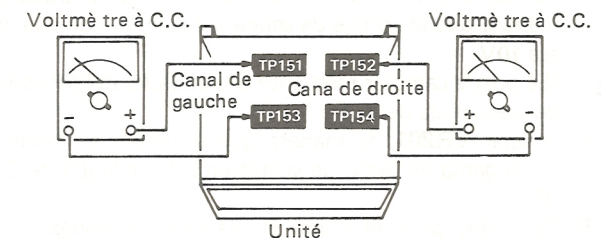
■ MESURAGES ET RÉGLAGES

Équipement utilisé

- Voltmetres électroniques à C.A. et à C.C. (EVM).
- Oscillateur de fréquence audio
- Resistance ou enceintes (8Ω, 100W)

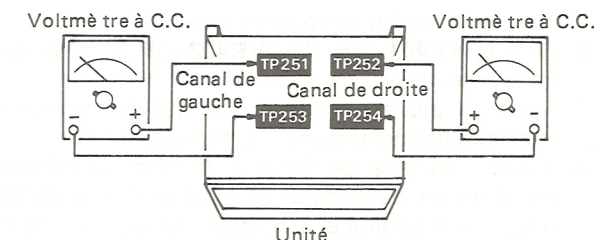
MISE AU POINT DU TEMPS MORT D'AMPLIFICATION (ICQ) DU RÉGLAGE DE TENSION (V)

1. Effecture le raccordement comme il est montré. (Raccorder le voltmètre à C.C. sur les deux canaux.)
2. Tourner complètement les volumes (V) du réglage d'amplification (**VR151, VR152**) dans le sens inverse des aiguilles d'une montre.
3. Mettre l'appareil en marche lorsqu'il est froid, et 30 sec. plus tard, régler **VR151** et **VR152** de telle sorte que la tension soit de **3mV**. Vérifier aussi que la tension soit de **10 – 18mV** (normale: **12mV**) après un intervalle de **10 – 15** minutes. (Au-dessous de **50mV**, après un intervalle de **60** min.)



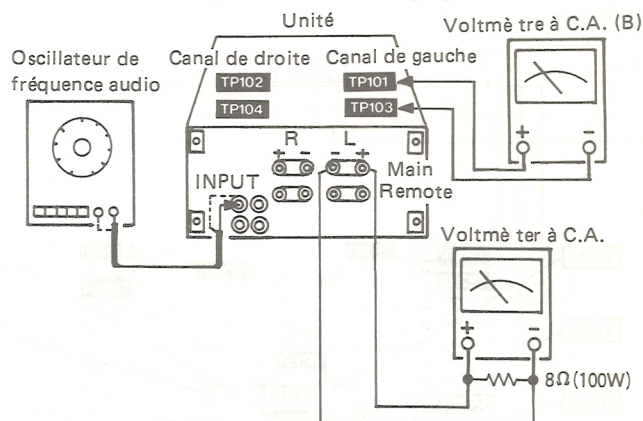
MISE AU POINT DU TEMPS MORT D'AMPLIFICATION (ICQ) DE L'IMPLUSION D'INTENSITÉ (C)

1. Effectuer le raccordement comme il est montré. (Raccorder le voltmètre à C.C. sur les deux canaux.)
2. Tourner complètement les volumes (C) du réglage d'amplification (**VR251, VR252**) dans le sens inverse des aiguilles d'une montre.
3. Mettre en marche l'appareil lorsqu'il est froid, et 30 sec. plus tard, régler **VR251** et **VR252** de telle sorte que la tension soit de **0,7mV**. Vérifier aussi que la tension soit de **2 – 4mV** (normale: **2,5mV**) après un intervalle de **10 – 15** minutes. (Au-dessous de **20mV** après un intervalle de **60** min.)



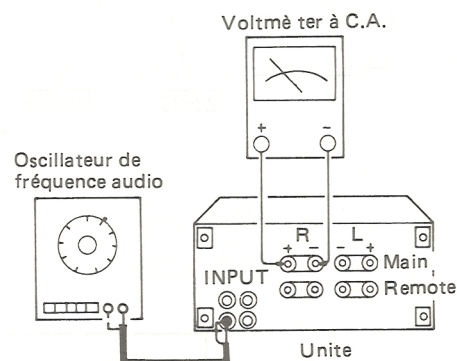
MISE AU POINT DE L'ÉQUILIBRAGE DE PONT

1. Effectuer le raccordement comme il est montré.
2. Tourner **VR201** (canal de gauche) et **VR202** (canal de droite) sur les positions centrales, avant de mettre en marche l'appareil.
3. Appliquer un signal de 1KHz à la borne d'entrée de telle sorte que la tension de sortie de la borne du haut-parleur soit de **10V**.
(Elle peut être modifiée par l'atténuateur de l'oscillateur de fréquence audio.)
4. Ajuster **VR201** de telle sorte que la tension soit minimale dans la plage de 3mV du voltmètre à électronique C.A. (B).
5. En outre, pour le canal de droite, changer le raccordement et effectuer le même réglage pour **VR202**.



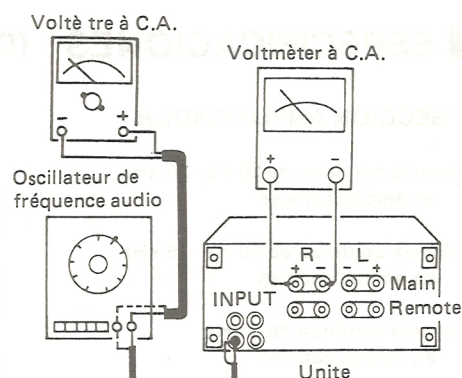
MISE AU POINT DU WATTMÈTRE

1. Effectuer le raccordement comme il est montré.
2. Tourner **VR401** (canal de gauche) et **VR402** (canal de droite) sur les positions centrales avant de mettre en marche l'appareil.
3. Avant la mise au point, s'assurer que le wattmètre soit mécaniquement réglé sur le point 0.
4. Appliquer un signal de 1KHz à la borne d'entrée, de telle sorte que la tension de sortie de la borne du haut-parleur soit de **28,3V**. (Elle peut être modifiée par l'atténuateur de l'oscillateur de fréquence audio.)
5. Régler **VR401** (canal de gauche) et **VR402** (canal de droite) de telle sorte que le wattmètre indique 100W.



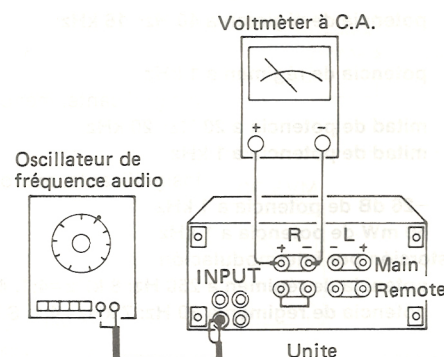
VÉRIFICATION DU FONCTIONNEMENT DU CIRCUIT D'ACCORD SILENCIEUX PENDANT L'OPÉRATION DE MISE SOUS TENSION/HORS CIRCUIT

1. Effectuer le raccordement comme il est montré.
2. Appliquer un signal de **0,5V**, 1KHz, à la borne d'entrée.
3. Vérifier que la sortie soit donnée **7-8,5** sec. après la mise sous tension, et que la sortie s'éteigne immédiatement avec la mise hors circuit.



VÉRIFICATION DU CIRCUIT DE DÉTECTION DE SURCHARGE

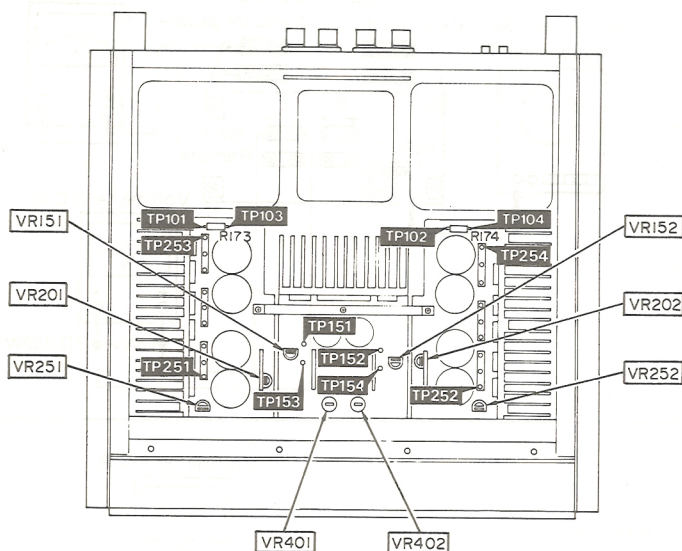
1. Effectuer le raccordement comme il est montré.
2. Régler le commutateur-sélecteur du haut-parleur sur **"main"**.
3. Court-circuiter les bornes du haut-parleur sur le côté **"remote"**.
4. Appliquer un signal de 1KHz à la borne d'entrée, de telle sorte que la tension de sortie de la borne du haut-parleur soit de **1,2V**.
(Elle peut être modifiée par l'atténuateur de l'oscillateur de fréquence audio.)
5. Vérifier que le relais soit mis hors circuit et que la sortie s'arrête lorsque le commutateur-sélecteur du haut-parleur est déplacé sur **"remote"**, et que cette condition soit conservée même avec le commutateur-sélecteur du haut-parleur réglé sur **"off"** (hors circuit).
6. Effectuer la même vérification sur le canal de gauche.



Nota

- * Vérifier séparément le circuit de protection sur chacun des canaux.
- * Le relais de protection, s'il est mis en marche, ne se remettra pas dans sa position initiale de lui-même. Aussi, mettre hors circuit l'alimentation en courant puis la remettre à nouveau en marche.
- * Lorsque le circuit de protection fonctionne, l'indicateur "stand-by" (mise en attente) clignotera.

● Points de réglage



Points de réglage	Reglages
TP151, 153	Mise au point de I_{CQ} au canal de gauche de l'amplification du réglage de tension.
VR151	
TP152, 154	Mise au point de I_{CQ} au canal de droite de l'amplification du réglage de tension.
VR152	
TP251, 253	Mise au point de I_{CQ} au canal de gauche de l'impulsion d'intensité.
VR251	
TP252, 254	Mise au point de I_{CQ} au canal de droite de l'impulsion d'intensité.
VR252	
TP101, 103	Mise au point de l'équilibrage de pont du canal de gauche.
VR201	
TP102, 104	Mise au point de l'équilibrage de pont du canal de droite.
VR202	
VR401	Mise au point du wattmètre du canal de gauche.
VR402	Mise au point du wattmètre du canal de droite.

ESPAÑOL

■ ESPECIFICACIONES (DIN 45 500)

■ SECCION AMPLIFICADOR

Potencia continua de 20 Hz~20 kHz en ambos canales	$2 \times 240W (4\Omega)$ $2 \times 170W (8\Omega)$
Potencia continua de 40 Hz~16 kHz en ambos canales	$2 \times 240W (4\Omega)$ $2 \times 170W (8\Omega)$
Potencia continua de 1 kHz en ambos canales	$2 \times 260W (4\Omega)$ $2 \times 180W (8\Omega)$
Distorsión armónica total	
potencia de régimen a 20 Hz~20 kHz	0,002% (4 Ω) 0,0007% (8 Ω)
potencia de régimen a 40 Hz~16 kHz	0,002% (4 Ω) 0,0007% (8 Ω)
potencia de régimen a 1 kHz	0,0004% (4 Ω) insignificante, menos 0,0002% (8 Ω)
mitad de potencia a 20 Hz~20 kHz	0,0007% (8 Ω)
mitad de potencia a 1 kHz	insignificante, menos 0,0002% (8 Ω)
-26 dB de potencia a 1 kHz	0,001% (4 Ω)
50 mW de potencia a 1 kHz	0,003% (4 Ω)
Distorsión por intermodulación	
potencia de régimen a 250 Hz: 8 kHz=4:1, 4 Ω	0,002%
potencia de régimen a 60 Hz: 7 kHz=4:1, SMPTE, 8 Ω	0,002%
TIM (distorsión intermodular transitoria)	insignificante
Ancho de banda de potencia con ambos canales, -3 dB (T.H.D. 0,01%)	5 Hz~100 kHz (8 Ω)
Zumbido residual y ruido	0,3 mV
Factor de amortiguamiento	50 (4 Ω), 100 (8 Ω)

Sensibilidad e impedancia de entrada	1,0 V/47k Ω
Relación de señal a ruido	110 dB (120 dB, IHF, A)
Respuesta de frecuencia	20 Hz~20 kHz, +0 dB, -0,1 dB 0,8 Hz~150 kHz, +0 dB, -3 dB
Equilibrio de canales, 250 Hz a 6,300 Hz	0,5 dB
Separación de canales, 1 kHz	60 dB
Impedancia y nivel de salida de los auriculares	870 mV/330 Ω
Impedancia de carga	
MAIN o REMOTE	4 Ω ~16 Ω
MAIN y REMOTE	8 Ω ~16 Ω
Medidor	
campo de lectura	0,0001 W~300 W (8 Ω) -60 dB~+2 dB (compresión logarítmica)
respuesta de frecuencia (precisión de lectura)	± 3 dB (más de -40 dB) ± 5 dB (menos de -40 dB)
tiempo de ataque	100 μ seg.
tiempo de recuperación (0 dB -- -20 dB)	300 mseg.

■ GENERAL

Consumo de energía	1350W
Alimentación de energía	CA 50 Hz/60 Hz, 110V/127V/220V/240V
Dimensiones (An.×Al.×Prof.)	430 × 209 × 475 mm
Peso	31,2 kg

Nota:

La distorsión armónica total se mide con el analizador de espectro digital (sistema H.P. 3045).

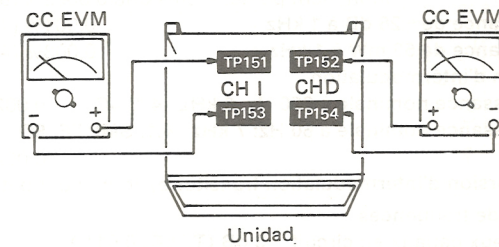
MEDICIONES Y AJUSTE

Equipo usado

- Voltímetro electrónico de CA y CC (EVM)
- Resistor O altavoces (8Ω , 100W)
- Oscilador de frecuencia de audio.

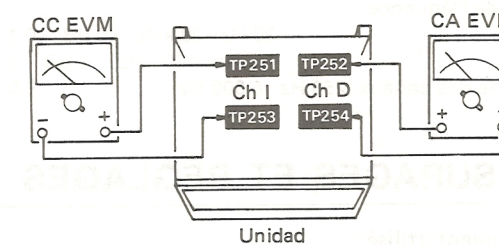
AJUSTE DE MARCHA LENTA DE AMP. (ICQ) DE CONTROL DE VOLTAJE (V)

1. Hacer la conexión como se muestra.
(Conectar el voltímetro de CC en ambos canales.)
2. Girar completamente los volúmenes de ajuste de amp. (V) (**VR151, VR152**) hacia la izquierda.
3. Prender el aparato cuando está frío y, 30 seg. más tarde, ajustar **VR151** y **VR152** de manera que el voltaje sea **3mV**. También, comprobar que el voltaje sea **10 – 18mV** (estándar: **12mV**) después de un lapso de **10 – 15** minutos. (Inferior a **50mV** después de un lapso de **60** min.)



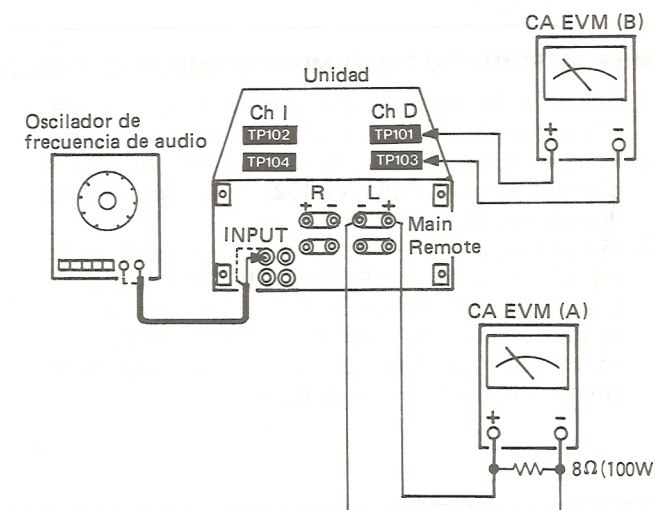
AJUSTE DE MARCHA LENTA (ICQ) DE EXCITACIÓN DE CORRIENTE (C)

1. Hacer la conexión como se muestra.
(Conectar el voltímetro de CC en ambos canales.)
2. Girar completamente los volúmenes de ajuste de amp. (C) (**VR251, VR252**) completamente.
3. Prender el aparato cuando está frío y, 30 seg. más tarde, ajustar **VR251** y **VR252** de manera que el voltaje sea **0,7mV**. También, comprobar que el voltaje sea **2 – 4mV** (estándar: **2,5mV**) después de un lapso de **10 – 15** minutos. (Inferior a **20mV** después de un lapso de **60** min.)



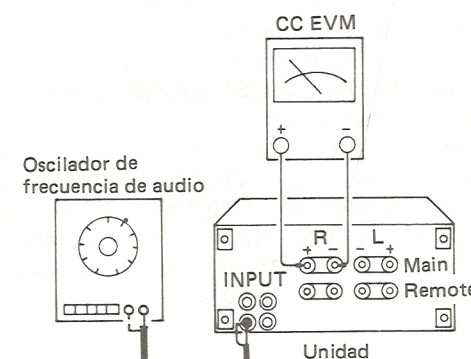
AJUSTE DE EQUILIBRIO DEL PUENTE

1. Hacer la conexión como se muestra.
2. Girar el **VR201** (CH I) y **VR202** (CH D) a las posiciones centrales antes de prender el aparato.
3. Aplicar una señal de 1KHz al terminal de entrada de manera que el voltaje de salida del terminal de altavoz sea **10V**.
(Se puede cambiar mediante el atenuador del oscilador de frecuencia de audio.)
4. Ajustar **VR201** de manera que el voltaje se mínimo en la gama de 3mV de voltímetro electrónico de CA (B).
5. También, para el canal R, cambiar la conexión y hacer el mismo ajuste mediante **VR202**.



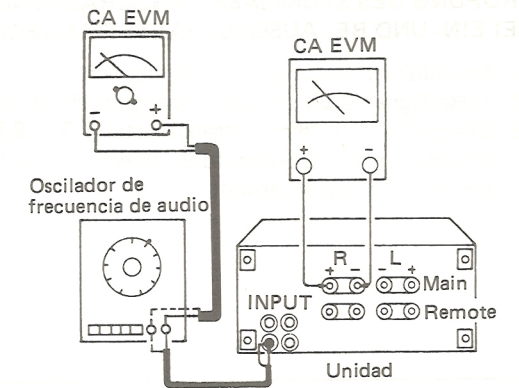
AJUSTE DE MEDIDOR DE POTENCIA

1. Hacer la conexión como se muestra.
2. Girar el **VR401** (CH I) y **VR402** (CH D) a las posiciones centrales antes de prender el aparato.
3. Antes de ajustar, asegurarse de que el medidor de potencia está mecánicamente ajustado al punto 0.
4. Aplicar una señal de 1KHz al terminal de entrada de manera que el voltaje de salida de terminal de altavoz sea **28,3V**. (Puede cambiarse mediante el atenuador del oscilador de frecuencia de audio.)
5. Ajustar el **VR401** (CH I) y **VR402** (CH D) de manera que el medidor de potencia indique **100W**.



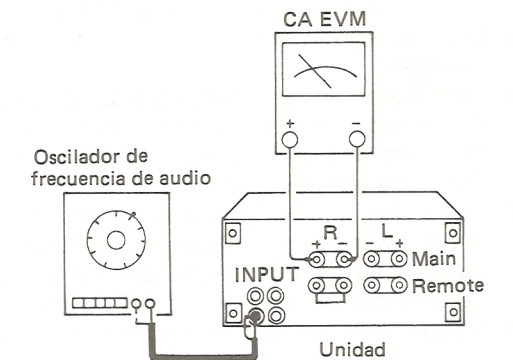
COMPROBACIÓN DE CIRCUITO SILENCIADOR DURANTE LA OPERACIÓN DE CONECTADO-DESCONECTADO

1. Hacer la conexión como se muestra.
2. Aplicar señal de **0,5V**, 1KHz al terminal de entrada.
3. Comprobar que la salida se dé **7 – 8,5** seg. después de conectar la corriente, y que la salida desaparezca inmediatamente con la desconexión de la corriente.



COMPROBACIÓN DE CIRCUITO DETECTOR DE SOBRECARGA

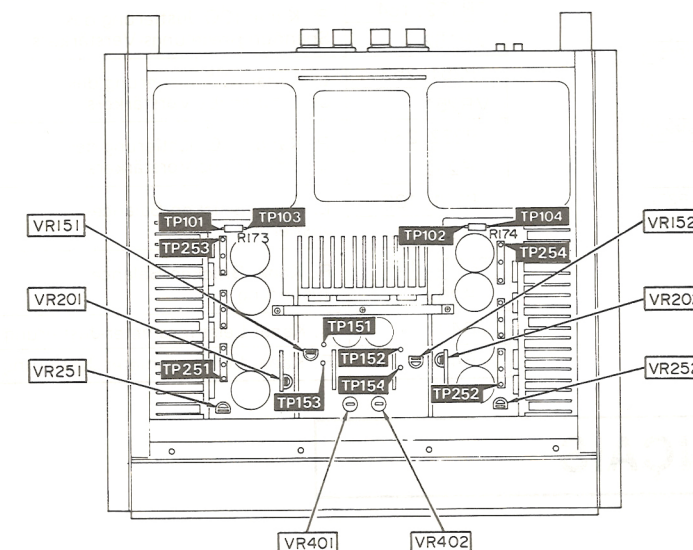
1. Hacer la conexión como se muestra.
2. Poner el interruptor selector de altavoz en "main" (principal).
3. Cortocircuitar los terminales de altavoz en el lado "remoto".
4. Aplicar una señal de 1KHz al terminal de entrada de manera que el voltaje de salida del terminal de altavoz sea **1,2V**.
(Puede cambiarse mediante el atenuador del oscilador de frecuencia de audio.)
5. Comprobar que el relé se desconecta y la salida para cuando el interruptor selector de altavoz es cambiado a "remoto", y que la condición se mantiene aun cuando el interruptor selector de altavoz es ajustado a "off" (desconectado).
6. Efectuar la misma comprobación en el canal I.



Nota

- * Comprobar el circuito protector independientemente en cada uno de los canales.
- * El relé protector, si operado, no se repondrá por sí mismo. Por lo tanto, desconectar el suministro de alimentación y, de nuevo, conectarlo.
- * Cuando el circuito protector está en operación, el indicador "de espera" está parpadeando.

Puntos de ajuste



Puntos de ajuste	Ajuste
TP151, 153	Adj. I_{CO} de CH I de amp. de control de voltaje
VR151	
TP152, 154	Adj. I_{CO} de CH D de amp. de control de voltaje
VR152	
TP251, 253	Ajd. I_{CO} de CH I de amp. excitador de corriente
VR251	
TP252, 254	Adj. I_{CO} de CH D de amp. excitador de corriente
VR252	
TP101, 103	Adj. de equilibrio del puente de CH I
VR201	
TP102, 104	Adj. de equilibrio del puente de CH D
VR202	
VR401	Adj. de medidor de potencia de CH I
VR402	Adj. de medidor de potencia de CH D